MARCH 15, 1914
VOL. VII :: NO. 1

NO TITLE-PAGE & INDEX ISSUED
Boston Show Number

SINGLE COPIES, 25c.
ONE YEAR, $1.00

THE COMMERCIAL CAR JOURNAL

Entered as Second-Class Matter at the Post Office at Philadelphia, Pa.

Baker Electrics

530
362
40

Baker Electric Trucks

Points of Superiority in the Baker Power System

Every extra dollar put into Baker construction is worth ten to the owner in the saving of repairs for ten years to come. Here are but a few instances of superiority in the Baker. There are many others, the result of which is higher initial cost and a much lower cost of operation.

300% OVERLOAD CAPACITY of the motor. This wide margin of reserve may be seldom needed, but in an emergency it means protection. A heavy load may have to start on a hill; the wheels may get lodged in a hole; the going may be bad. The Baker motor is equal to any demand upon it; won't burn out.

THE WIDE MOTOR DRIVING CHAIN, 50% wider than on other trucks. It runs in oil, enclosed in a cast aluminum housing. Dirt is kept out and oil is kept in—much more effective protection than is afforded by the sheet metal guards employed by other trucks.

DRIVING SPROCKETS are punched out of plate steel and hardened. May also be reversed, taking wear on both sides of the teeth, thus doubling the life. The usual sprocket is soft, and is not reversible.

"Electric Trucks Last for Ten Years"

THE BAKER MOTOR VEHICLE CO., CLEVELAND

LIBRARY OF CONGRESS NOV

PUBLISHED THE 15TH OF EACH MONTH

CHILTON COMPANY

MARKET & 49TH STS. PHILADELPHIA

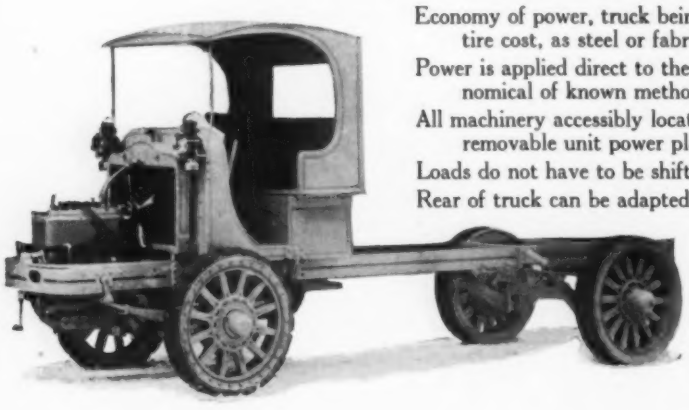
TL1
.C57

Why Sell Trucks That Waste Power?

Did you ever try to push a heavily loaded wheelbarrow through soft sand? Well, try it and you'll find that you can turn around and pull it through with one-half the effort. If only two wheels are driven, they should be the front, not the rear. Tests have shown conclusively that it takes less power to pull than it does to push it.

Walter Front-Wheel Drive Truck

HAS THE FOLLOWING ADVANTAGES:



Economy of power, truck being pulled instead of pushed; phenomenally low tire cost, as steel or fabric tires can be used on the rear wheels.

Power is applied direct to the front wheels by the simplest and most economical of known methods—two enclosed spur gears.

All machinery accessibly located in the front in the form of a quickly removable unit power plant.

Loads do not have to be shifted.

Rear of truck can be adapted to any kind of work, there being no machinery under or back of the seat, facilitating the use of long or short bodies of various types. Non-skidding a feature of front-wheel drives.

3 TON	$3200
3 TON (rear tires rubber)	3400
4 TON	3500
5 TON	3750
6 TON	4000
7½ TON	4250

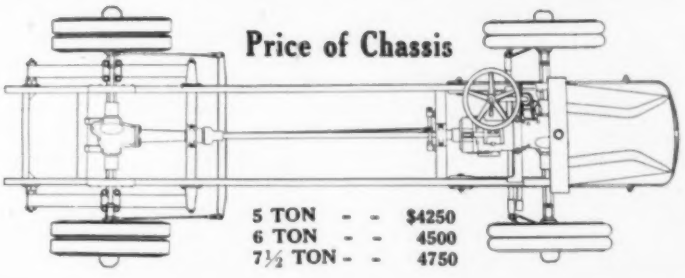
Walter Four-Wheel Drive Truck for Heavy Loads

It Combines Pushing and Pulling and Can't Be Stalled

The Government specifies this form of drive for army purposes. The advantages aside from tractive power are:

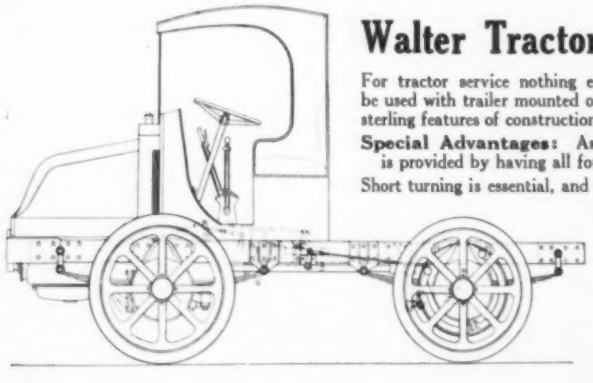
Smaller Motor: Will do the same work when driving to advantage through all four wheels, driving strains are equalized. Brakes on all four wheels.

Brief Specifications: En bloc motor; 4⅝ bore by 6 stroke, four speeds forward and reverse; wheels, front, 40 x 4 dual; rear, 40 x 8 steel shod, or 40 x 5 dual fabric tires.



Price of Chassis

5 TON	$4250
6 TON	4500
7½ TON	4750



Walter Tractor, Four-Wheel Drive and Steer

For tractor service nothing equals the short-wheelbase four-wheel drive and steer truck. Can be used with trailer mounted on fifth wheel, or to haul a train of trailers. Same power plant and sterling features of construction as the other Walter models.

Special Advantages: As the truck carries but small part of the load, the necessary traction is provided by having all four wheels driven.

Short turning is essential, and made possible by the four-wheel steer feature.

The great momentum of tractor and train is cared for by the simultaneous application of brakes to all of the four driving wheels.

Price of tractors hauling up to 12 tons, **$4500**

DEALERS

You can make good money handling this unique and unduplicated line of high-efficiency, power-saving, economy-producing trucks. We have some desirable territory open to responsible dealers. Write us about your town.

Walter Motor Truck Co., 49-51 W. 66th St., New York City

THE PUBLISHERS' PERSONAL PAGE

"A wise man scorneth nothing, be it never so small or homely"

Up to this year the small commercial car unit has been sadly neglected by truck makers. There seems to have been a feeling that quicker returns could be had by manufacturing large trucks.

Early Dissatisfaction Due to Costliness of Large Units

In the beginning, much of the dissatisfaction which was experienced by the early users, may be laid directly to the fact that they had a too costly experience with high-priced large units. There was nothing else with which they could experiment, as practically all the makers were devoting themselves exclusively to large capacity vehicles.

Small Car and Quantity Production

It remained until the present year for the manufacturers to realize that they were overlooking an enormous field in the small delivery unit; that in quantity production and sales lay even greater profits than in selling a limited number of large units. Recognized by a few, this class of commercial car is now being exploited. But, even yet, the extent of the demand and advantages of producing small cars, are not appreciated by many.

There will be an awakening for some, we fear, too late.

Small Car Here

The industry is to be congratulated on the advent of the small commercial car, the incentive to which is probably due to the introduction of its sister small car in the pleasure car field. As in that branch of the industry, we now have in the commercial cars, units of a size and price which will meet the requirements of the vast majority of users.

The Autocar

FIVE TIMES AROUND THE EARTH DAILY

This is the distance traveled every day by AUTOCARS operated in the service of 1300 of the country's foremost merchants. The AUTOCAR forms the connecting link between the store and the customer who resides in the suburbs and country sections 30 miles distant, making it possible to carry on trade with families located at points in the surrounding territory.

Some concerns using AUTOCARS exceed 60 and 100 miles in their deliveries. All users agree that the AUTOCAR is a money-maker, and indispensable to the expansion of their business. At a Chassis price of $1850, the AUTOCAR is, without exception, the best Motor Delivery Vehicle on the market today.

Write for new literature concerning some interesting facts about the service AUTOCARS provide. Don't fail to place your order **now** to insure securing an AUTOCAR for Spring Deliveries, as it requires from six to eight weeks to complete special bodies.

The Autocar Company, Ardmore, Pa.
ESTABLISHED 1897

MOTOR DELIVERY CAR SPECIALISTS

FOR BUSINESS EXPANSION

The Commercial Car Journal

VOLUME VII PHILADELPHIA, MARCH 15, 1914 NUMBER 1

AUTOMOBILE CHAMBER OF COMMERCE TO TAKE ACTIVE MEASURES AGAINST LEGISLATION UNFAIR TO MOTOR CARS

At the last meeting of the Automobile Chamber of Commerce that body decided to go on record in an active way as being opposed to legislation in the various States, which provides: 1st. For local licenses or registration fees or regulations upon automobiles or their owners which give authority to a local jurisdiction to regulate the operation of automobiles, such regulations, licenses or registration being in addition to those imposed by the State laws. 2d. For burdens upon automobiles not borne by horse-drawn vehicles. 3d. Double taxation on automobiles through the imposition of a personal property tax in addition to the registration and license fees. 4th. An occupation tax on either agents or manufacturers of automobiles or to restrict or regulate the automobile industry or trade by special legislation. 5th. Requiring the use of any specific or proprietary devices or attachments on automobiles in addition to the manufacturers' standard equipment.

MOTOR TRUCK MAKES GOOD IN ARMY WORK

The army motor truck is proving a marked success in the service it is performing on the Rio Grande border. Three trucks are used in the border service, and it is more than likely that more will be added. Some of the camps of the United States troops are situated from 50 to 100 miles from a railroad, and the trucks make the life of the soldiers easier. One of these trucks, which is now operating between Fort McIntosh and the camps below Laredo, Tex., makes a round trip of 132 miles daily over a road so rough that it is seldom traveled by ordinary vehicles. The motor trucks are of the Avery manufacture. On their outgoing trips each of the trucks is loaded with 3 tons of commissary supplies, besides a trailer carrying 2 tons. The average time made by this loaded truck and trailer in this rough region is 6 m.p.h.

TO ESTABLISH UNIFORM STATE AUTOMOBILE LAWS

An interstate automobile vehicle law commission, representing eight different States, at a recent convention adopted a report recommending uniform laws for the States represented, which were New York, New Jersey, Connecticut, Massachusetts, Pennsylvania, Maine, Maryland and Delaware. This report is very lengthy, but concisely the provisions recommended are: that vehicles shall be operated with due regard to the public safety, and the width of the highway, and the condition of traffic. Speed limit is fixed at 24 m.p.h. Any speed beyond this is to be considered prima facie evidence of reckless driving. The report does away with the distinction between chauffeur and operator, and provides for an examination as to competence before a license is granted to any driver. It gives the power to the Secretary of State or motor vehicle commissioner to refuse licenses or to suspend or revoke them for intoxication or other cause, and provides for the control of non-resident motorists through complaint to the proper authorities in his home State; and that lights should be carried on all vehicles no matter what their motive power.

The New York State Commissioner, however, did not agree with the others in this report, and is recommending to his State what he considers a model law, which could be made universal. It is as follows: "Operators of motor vehicles and all other users of the highways shall at all times use diligence in such use of the highways and shall conform in every way with established customs or rules of the roads under penalty duly provided." He maintains that under this law the driver of any vehicle faces the good old common law penalty for negligence, which ranges all the way from a fine to a felony sentence.

THE MOTOR TRUCK CLUB OF AMERICA will discuss the question of relieving New York's westward traffic by the construction of bridges or tunnels across the North River, at its meeting to be held at the Automobile Club of America, 54th Street, New York City, on March 18th. It has been more than a year since the last contribution to the subject appeared in the report of the New Jersey Interstate Bridge and Tunnel Commission, and an effort is now being made to bring the matter to a head. Plans are under way for the presentation of bills of authorization before the adjournment of the present session of the New York Legislature on March 27th.

Table of Contents

S. A. E. STANDARD SUBCOMMITTEES TO STANDARDIZE LOAD CAPACITY FIGURES

Two sub-committees of the Standards Committee of the Society of Automobile Engineers on March 3d met in New York City to discuss the question of wheels for motor trucks. At this meeting the matter of carrying capacity was taken up. At the present time there is some confusion owing to the fact that one manufacturer of tires publishes a table of tire sizes, giving the load carrying capacity of different sizes, and another maker publishes a similar table, but giving different road carrying capacities for the same sized tire. The Standards Committee is endeavoring to have all makers of tires, if possible, give uniform load carrying capacity figures.

The question of the number of bolts securing different makes of solid tires to the wheels was further discussed. At present one make of tires requires so many transverse bolts through the wheel felloe to hold the retaining flange in place; another make requires a different number of bolts so that boring holes in the felloe is necessary. The committee, to standardize this work, is considering using three different numbers of bolts for the same size wheel or tire, which are as follows:

26-in. wheel	10, 15 or 20 bolt holes
28-in. wheel	12, 18 or 36 bolt holes
30-in. wheel	12, 18 or 36 bolt holes
32-in. wheel	12, 18 or 36 bolt holes
34-in. wheel	14, 21 or 42 bolt holes
38-in. wheel	14, 21 or 42 bolt holes
40-in. wheel	14, 21 or 42 bolt holes

Different numbers of bolt holes are required by different makes of tires, due to the fact that in some the tire retaining flange secured by these bolts has little work to perform, whereas in other makes of tires there is a constant tension on this flange, and therefore more bolts are required. It is possible to attach any tire with the three different numbers of bolt holes in the different sized wheels.

Packard Motor Car Company, Detroit, held a convention for its truck sales managers on March 1st. Twenty-one managers, stationed in all parts of the country, were in attendance. Hereafter sales of Packard trucks will be credited to the sales managers, and the winning truck manager and his organization will get a pennant and a $500 bull dog at the end of the season.

KNOX COMPANY TO BE SOLD AS A GOING CONCERN

Chas. G. Gardner, trustee of The Knox Automobile Company, Springfield, Mass., has issued a circular to the effect that the entire property of the company will be sold either at private sale or public auction. Special effort will be made to sell the company as a going concern as its business is in a prosperous condition, having done a gross business of $1,250,-242.41 during the past year under the receiver's management. This business was mainly in Martin tractors and motor fire apparatus, and it is stated that the orders for these are increasing.

The sale will include the factory buildings, machinery, supplies, parts, finished and unfinished cars, and good-will and right to the use of the Knox name.

STANDARD MOTOR TRUCK COMPANY OF OHIO TO EXPAND

The Standard Motor Truck Company of Ohio, with factory at Warren, Ohio, and offices at 1824 Euclid Avenue, Cleveland, Ohio, have arranged for additions to its plant at Warren, Ohio, which will enable it to increase its output 400 per cent. This addition is made necessary by the great demand for the company's product.

President C. W. Moody also announces the acquisition of W. M. Roberts, formerly sales manager of The Stewart Iron Works. Mr. Roberts will be the general sales manager for the Standard Company, making his headquarters at the Cleveland offices of the company.

AVERY COMPANY SOLVENT

Avery Company, Moline, Ill., has been declared solvent, according to the findings of its creditors, who have, therefore, granted an extension of one year on the $2,000,000 notes they hold, and which bear 6 per cent. interest, payable quarterly. The privilege of further extension was also accorded. The assets are shown to be $6,000,000 and the liabilities $2,200,000.

MAIS MOTOR TRUCK COMPANY AGAIN IN THE FIELD

Mais Motor Truck Company, Indianapolis, Ind., has paid its last obligation to Franklin Vonnegut, receiver for the old Mais Motor Truck Company. The present corporation, which succeeded the Mais Motor Truck Company, has continued the business, discounting its bills and has promptly met all its obligations. The officers of the present organization are as follows: H. G. Francis, of the Chas. E. Francis Company, of Rushville, Ind., President; W. M. Pearce, of the Innes-Pearce Company and the Park Furniture Company, Rushville, Vice-President; A. S. Lockard, Secretary and Treasurer; L. A. Caswell, Superintendent, and J. S. Sinclair, Purchasing Agent.

The officers declare that conditions are very favorable for the company, and large orders for delivery in the spring have been received. The demand for medium-priced trucks is said to be much greater than for heavier trucks. After the company became involved, a number of stockholders joined in an agreement to raise $75,000 to float the company and prevent pressure by creditors. After the sale of the property by the receiver there were $71,000 assets, while there were $118,000 of general creditors before fund was raised, creditors for $35,000 after it was raised and $67,000 of notes of company given in return for the subscriptions to the $75,000, while the committee raising the $75,000 had accepted $8,000 in notes of stockholders in lieu of the cash under the subscription. The court holds that the $35,000 of creditors after subscription and the assignees of some of the notes of the company given in return for the stockholders' subscription, and the $118,000 of claims are preferred to the subscribing stockholders, with their notes. The subscription agreement for the raising of $75,-000 floating fund provided "this is not to be binding until $75,000 is subscribed and paid in," but the agreement gave the committee named by the agreement such plenary powers that they were within their power in accepting promissory notes as subscriptions to the $75,000 fund.

M. A. M. TO MOVE

The Motor and Accessory Manufacturers has leased offices in the Aeolian Building, 29 West 42nd Street, New York City, for headquarters. It expects to take possession of the new offices on or about April 1st.

Armored Machine-Gun Motor Car on Mack Chassis

It is used by the Mexican Constitutionalists for carrying ammunition, etc.; also the deadly fire of machine guns can be directed through small port holes in the walls. The car is fitted with armored wheels for operation upon the railroad, where a continuous stretch of tracks remain, or, by quick adjustment, the wheels can be changed to run over the roads.

ALFRED REEVES ELECTED GENERAL MANAGER OF THE N. A. C. C.

National Automobile Chamber of Commerce, Inc., New York City, at its monthly meeting on March 4th, elected Alfred Reeves general manager to succeed Samuel A. Miles, who, after fourteen years of Association work, retires to devote his entire time to the management of the automobile shows in Chicago and New York, and some other personal interests.

Alfred Reeves was formerly manager of the Association of Licensed Automobile Manufacturers, and three years ago entered the automobile manufacturing trade. He has disposed of his interests in the Hartford Suspension Company, of New Jersey, resigning as vice-president and general manager, in order to take charge of the National Automobile Chamber of Commerce.

THE WILSONS TO QUIT FERRO COMPANY AND START A NEW FOUNDRY

C. B. Wilson, who has been active in the inside management of the Ferro Machine & Foundry Company, Cleveland, O., and David Wilson, who has occupied a similar position in the sales end, have severed their connection with the company, and it is stated that they will start a plant of their own in Detroit, Mich., for the manufacture of the same line of motor castings, etc., as that made by the Ferro Company.

LIGHT BECOMES WAYNE LIGHT

Light Commercial Car Company, 1790 Broadway, New York, has changed its name to The Wayne Light Commercial Car Company, Inc., to avoid confusion with another company having a similar name. It is understood that the company is about to embark on an extended program for expansion, details of which will be available later.

FEDERAL RUBBER STAGES A MINSTREL SHOW

On February 21st at the Pabst Theatre, Milwaukee, the employes of the Federal Rubber Manufacturing Company staged a very commendable performance of minstrelsy to a capacity house, including among its patrons ex-Mayor David S. Rose and other prominent citizens, employes' friends, etc.

The Littleford Brothers Sheet Steel & Iron Works Company, of 453-457 East Pearl Street, Cincinnati, Ohio, announce that they have recently equipped their plant and are now manufacturing steel bodies of special construction for commercial cars. These bodies and the special features of construction and manufacture will be described in an early issue.

Keystone Buggy Company, Columbus, Ohio, is planning to build automobile hearses. The company will build a plant in the northern part of the city.

HENRY SOUTHER NOW VICE PRESIDENT OF FERRO MACHINE & FOUNDRY COMPANY

It has just been announced that Henry Souther has identified himself with The Ferro Machine & Foundry Co., Cleveland, and has been elected Vice-President of that concern.

Mr. Souther brings to his new connection an ability and an experience which are well known throughout the country. Since his graduation from the Massachusetts Institute of Technology, in 1887, he has been prominent in the fields of metallurgy and engineering.

HENRY SOUTHER

Well-known automobile engineer joins the Ferro Machine and Foundry Company, as vice president of the organization.

He began his business and professional career with the Pennsylvania Steel Company, Steelton, Pa., leaving there in 1893 to become engineer for the Pope Manufacturing Company, Hartford.

In 1899 Mr. Souther opened his office and engineering laboratories at Hartford.

Mr. Souther has been especially prominent in the automobile industry, having been Consulting Engineer to the Association of Licensed Automobile Manufacturers during the life of that organization, and was President of the Society of Automobile Engineers during 1911. For the last four years he has been identified with the Standard Roller Bearing Company, being responsible to them for the character of material used.

As Vice-President of The Ferro Machine & Foundry Company Mr. Souther establishes a connection which should be valuable not only to both parties immediately concerned, but to the industries which are served by that concern.

Oliver H. Bair, one of Philadelphia's most prominent undertakers, has bought five White trucks with combination casket and hearse bodies.

HOPEWELL TIRE CASE PATENTS DECLARED INVALID

The Circuit Court of Appeals has just reversed the decision of the Circuit Court which sustained both the Hopewell and Kinder patents. The lower Court upheld the validity of these patents against the contention of the Vehicle Apron and Hood Co. (J. P. Gordon Company). This Court decided that Hopewell and Kinder were the original inventors of the Endless Spiral Spring Tire Cover. The decision of the Circuit Court of Appeals was based entirely upon non-patentability, which means that nothing was involved in the production of the tire case but mechanical skill rather than inventive genius and, therefore, it was not patentable. It would appear therefore that anyone is now at liberty to make a tire case of this type. Hopewell Brothers state that anyone buying their case need have no fear of patent litigation as they will protect all parties who buy their Spiral Spring Tire Covers against patent litigation.

Kelly-Springfield Tire Company, New York City, has declared a quarterly dividend of 1.5 per cent. on the preferred stock, payable April 2.

J. P. Sjoberg & Company, 1314 Avenue A and 350 West Fifty-second street, New York, makers of motor car bodies, has assigned to Lewis H. Woodburn.

Bumiller-Remelin Company, 432 Main Street, Cincinnati, Ohio, will in the future be known as The Herman Bumiller Company, owing to the retirement of M. E. Remelin, former secretary and treasurer. There will be no change in the management of the company.

Jenick Motor Corporation, Port Chester, N. Y., has filed a voluntary petition in bankruptcy, showing assets of $15,567.73 and liabilities of $22,802.50. Stephen Jenick, formerly active in the company and still in control, it is understood, has become associated with the Nott Fire Engine Company, Minneapolis, Minn.

Col. George Pope, as receiver for the Pope Manufacturing Company, Hartford, Conn., has filed a report of the financial conditions of the company as existing on December 31, 1913. There was then on hand cash to the amount of $106,092 as compared with $85,404 on November 28th, when he took charge. The December sales of the company totaled $113,280.

Gramm Motor Truck Company, Walkerville, Ont., is suing the Gramm Motor Truck Company, of Lima, Ohio, for $25,000 alleged overcharge. The Walkerville plant was started by the Lima company, and it was to pay a royalty of from $170 to $375 on every vehicle manufactured and was to obtain material and parts from the Lima plant at cost. The Walkerville factory learned that it was paying jobbers' prices for its materials, whereupon it started suit.

Hagstrom Brothers Manufacturing Company, Lindsborg, Kans., has been purchased by R. J. Laubengayer and F. J. Merrill, of Salina. The company manufactures automobile supplies and accessories and electrical appliances. The business offices and salesrooms are to be moved to Salina, Kans.

Conventions of Interest to the Trade

National

April 22-25—at Savannah, Ga. Convention of National Drainage Congress. Edmund P. Perkins, Chicago, Ill., President.

April 29-30—at Boston, Mass. National Association of Cotton Manufacturers. Edwin Farnham Greene, President.

June 13-19—at Toledo, Ohio. National Convention of Woodmen. Edw. C. Frank is chairman of the committee of arrangements.

June 17-19—at Minneapolis, Minn. National Wholesale Grocers' Association of the United States. Headquarters at Hotel Radisson. Oscar B. McGlason, President; Mr. Beckman, Secretary; J. W. Bragdon, Minneapolis, and H. Huntoon, Stillwater, are interested.

July 7-9—at New York City. Annual Convention of National Leather and Shoe Finders' Association. Merchants' Association will probably prepare for the event.

May—at Indianapolis, Ind. Convention National Retail Hardware Association. M. L. Corey, Secretary, Argos, Ind.

October—Louisville, Ky. National Convention of the Kentucky Bottlers' Association to be held in the Armory. Samuel Leidigh, is President of both the State and National Associations.

State

March 30-April 4—at Wheeling, W. Va. Wheeling Grocers' Association preparing for pure food show to be held at the Market auditorium. J. C. Strobe, Secretary.

April—at Albany, N. Y. Convention of New York State Embalmers' Association. William S. Drinkwater, New York City, President.

The list of conventions given herewith is published each month so that commercial car manufacturers can communicate with the proper authorities with the idea of arranging to give lectures, illustrated talks, statistics, etc., to show the advantage of motor trucks in these various lines; also possibly to show and demonstrate their cars.

April 3-8—at Salt Lake City, Utah. Manufacturers' Association preparing for exhibit to be held. D. F. Collett is interested.

April 7-9—at San Antonio, Tex. Lumbermen's Association of Texas to convene. The association's headquarters are at Houston.

April 7-10—at Louisville, Ky. Farmers and Business Men's Convention.

April 16-26—at Omaha, Nebr. Low-Cost-of-Living Show to be held at the Auditorium. Associated Retailers of Omaha preparing for event. G. T. Morton is also interested.

May 5-7—at Little Rock, Ark. Retail Hardware Association of Arkansas, to convene in this city. Grover T. Owen, of this city, is Secretary.

May 26-27—at New York City. Board of Governors of the American Manufacturers' Association will hold convention. Merchants' Association will probably have charge of the event.

June 1-6—at Topeka, Kans. Topeka Retail Grocers' Association will hold pure food show. Committees are making preparations for show.

June 9—at Clarksburg, W. Va. West Virginia Business Men's Association to hold annual meeting.

June 16-17-18—at Des Moines, Ia. Iowa Retail Merchants' Association will hold annual convention.

July 7-9—at Raleigh, N. C. Retail Hardware Association of Carolina. T. W. Dixon, of Charlotte, N. C., is Secretary.

July 14-16—at Cedar Point, Ohio. Ohio Retail Grocers' & Meat Dealers' Association to hold 15th annual convention.

August 11-14—at Eldon, Ia. Big Four Fair Association will hold fair.

August 31-Sept. 5—at Santa Rosa, Cal. District Agricultural Fair to be held. Directors of the Chamber of Commerce are preparing for event.

September 16-19—at Batavia, N. Y. Genesee County Fair to be held.

September 21-26—at Decatur, Ala. North Alabama Fair to be held. James H. Stone, of New Decatur, is Secretary of the organization.

October 12-17—at Birmingham, Ala. Alabama State Fair to be held. Sam Fowlkes, Secretary of the Alabama Fair Association, is preparing for event.

October 13-16—at Harrisonburg, Va. Rockingham County Fair. Extensive arrangements are being made.

October 20-23—at New Orleans, La. International Fire Chiefs' Association to convene. Chief Louis Pujol preparing for event.

October 20-24—at Hope, Ark. Hempstead County fair. W. W. Thorp, Secretary.

November 7-13—at Macon, Ga. Georgia State Fair. Harry C. Rubert is Secretary and general manager.

Personal News

R. G. Betts, who has been for a number of years editor of the "Motor World," has resigned from that publication.

E. J. Thompson, formerly department manager of the Motz Tire & Rubber Company, has been promoted to position of sales manager.

D. R. Harrington, connected with the Universal Motor Truck Company, has resigned to join F. K. Parke, in the International Cyclecar Company.

E. G. Soward, formerly connected with the Thos. B. Jeffery Company, has become business manager of the Velie Motor Vehicle Company, Moline, Ill.

DeWitt Page, who has been identified with the New Departure Manufacturing Company in various capacities, has become general manager of the company.

Frank E. Lamb, formerly connected with the Gramm Motor Truck Company, Lima, Ohio, has become sales manager of the Ideal Auto Company, Ft. Wayne, Ind.

L. F. Baechle has become sales manager of the Mathiesen Spring Cushion Wheel Company, Chicago. The company's efforts will hereafter be directed largely to the motor truck field.

James W. Cain, who has been associated with the McCord Manufacturing Company, Detroit, since its inception, has resigned to engage in the railroad supply business in Houston, Tex.

Otis R. Cook has become general sales manager of the Kelly-Springfield Tire Company, and will make his headquarters in Cleveland, Ohio. He entered the service of the Kelly-Springfield Tire Company in 1910 and since then he has been very successful in promoting sales, and the appointment gives him a well-earned reward.

H. McK. White, who was previously advertising manager of several important concerns in Indianapolis, has become advertising manager of the Ferro Machine & Foundry Company, Cleveland, Ohio.

Lloyd B. Buzby, chief engineer of the gasoline engine department of the Electric Launch Company, has resigned to take charge of the engineering work of the Duplex Engine Governor Company.

J. S. Ridley, formerly manager of the New York City branch of the Firestone Tire & Rubber Company, has become manager of the new branch and service station at 84 and 91 Bank Street, Newark, N. J.

W. C. Alcorn, former factory manager of the Consolidated Manufacturing Company, has been appointed manager of the sheet metal stamping department of the Transue & Williams Company, Alliance, Ohio.

Charles E. Collard, who has been manager of the truck tire department of the Goodyear Tire & Rubber Company's New York branch, has been appointed New England manager for the Vulcan-Bessemer Company.

Wallace C. Hood has been appointed sales manager of the Standard Motor Truck Company, Detroit, Mich., succeeding Geo. D. Wilcox. Mr. Hood recently resigned from the Empire Automobile Company, Indianapolis.

Charles B. Hatfield, Jr., formerly connected with the Hatfield Motor Truck Company, Elmira, N. Y., has organized a corporation for the manufacture of a cyclecar to be known as the O-We-Go. This car will be manufactured in a portion of the Ives Company's plant at Owego, N. Y. The following officers were elected: Geo. Ramsey, president; W. I. Payne, vice-president; Geo. F. Ramsey, treasurer; Chas. B. Hatfield, Jr., secretary and general manager

E. R. Marsters, who for 12 years passed, has been connected with the automobile industry in New England, has joined the forces of the Koehler Sporting Goods Company, and will devote his time to Koehler sales.

W. M. Roberts, formerly sales manager of the Stewart Iron Works Company, Cincinnati, Ohio, has resigned to become general sales manager of the Standard Motor Truck Company of Ohio, with headquarters at Cleveland, Ohio.

O. P. Wilson, formerly connected with the purchasing department of the Westinghouse Electric & Manufacturing Company, has resigned to accept position of assistant general manager of the Norma Company of Amer., New York City.

Joseph J. Martin, formerly travelling representative of the Commerce Motor Car Company, Detroit, Mich., has become district sales manager of the Stewart Motor Corporation, Buffalo, N. Y. He will have headquarters at Chicago, Ill.

Harry M. Snyder, secretary and director of the Reo Motor Car Company and the Reo Motor Truck Company, Lansing, Mich, has severed his connection with these companies. He plans to travel for a year before engaging in business again.

Frederick A. Curtis, who was formerly in charge of the Chicago branch of the Knox Automobile Company, has been appointed manager of the New York City branch of the same company, succeeding Howard Davis, who has taken the Lyons-Knight agency.

Walter G. Clark, efficiency expert and consulting engineer, of New York City, is now in Los Angeles, to install a system for the Motor Truck & Terminal Company, which now operates forty-seven trucks and has ordered forty more for use in competition with the railroads within a radius of fifty miles of Los Angeles.

Revision of S. A. E. Standards Committee

In accordance with the custom to revise annually the personnel of the Standards Committee of the Society of Automobile Engineers, the Council at its last meeting made appointment of members of the Standards Committee, for the year of President Henry M. Leland's administration. There has not been much change in the personnel of the whole committee or in the Chairmanships of the divisions thereof. The Research Division and the Electric Vehicle Division have been newly created and four Divisions have been discontinued for the time being. The make-up of Divisions applying more particularly to commercial cars is given herewith.

COMMERCIAL CAR WHEELS DIVISION

William P. Kennedy, Consulting Engineer, *Chairman.*
J. A. Anglada, Consulting Engineer.
H. D. Church, Truck Engineer, Packard Motor Car Company.
C. B. Hayes, President and General Manager, Hayes Wheel Company.
Russell Hoopes, Superintendent, Hoopes Bros. & Darlington, Inc.
A. M. Laycock, Chief Engineer, Axle Department, Sheldon Axle Company.
J. Morat, Engineer, I. G. Johnson & Company.
A. J. Scaife, Engineering Department, The White Company.
A. J. Slade, Consulting Engineer.
Charles L. Schwarz, wheel manufacturer.
E. R. Whitney, Chief Engineer, Commercial Truck Company of America.
C. B. Whittlesey, Factory Manager and Secretary, Hartford Rubber Works.

ELECTRIC VEHICLE DIVISION

J. R. Coleman, Chief Engineer, Atterbury Motor Car Company.
R. S. Fend, Chief Engineer, Woods Motor Vehicle Company.
Emil Gruenfeldt, Chief Engineer, Baker Motor Vehicle Company.
J. H. Hertner, Mechanical Engineer, Rauch & Lang.
Benjamin Jerome, Chief Draftsman and Engineer, Couple Gear Freight Wheel Company.
William P. Kennedy, Consulting Engineer.
J. M. Lansden, General Motors Truck Company (New York City).
Ernest Lunn, President, Walker Vehicle Company.
A. J. Slade, Consulting Engineer.
W. J. B. Thomas, Chief Engineer, Century Electric Car Company.
P. D. Wagoner, President, General Vehicle Company.
C. A. Ward, Secretary and Treasurer, Ward Motor Vehicle Company.
E. R. Whitney, Chief Engineer, Commercial Truck Company of America.

TRUCK STANDARDS DIVISION

William P. Kennedy, Consulting Engineer, *Chairman.*
B. B. Bachman, Assistant Engineer, The Autocar Company.
H. D. Church, Truck Engineer, Packard Motor Car Company.
C. E. Clemens, Mechanical Engineer, Perfection Spring Company.
A. H. Ehle, Manager Electric, Compressed Air and Gasoline Locomotive Department, Baldwin Locomotive Company.
Bruce Ford, Engineer in charge of Department of Development and Design, Electric Storage Battery Company.
W. A. Frederick, Chief Engineer, Continental Motor Manufacturing Company.
Robert McA. Lloyd, Consulting Engineer.
C. T. Myers, Consulting Engineer.
W. H. Roberts, Assistant Engineer, Department of Finance, New York City.
E. F. Russell.
C. L. Schwarz, wheel manufacturer.
F. W. Trabold, Manager Sales Department, J. H. Williams & Company.
E. R. Whitney, Chief Engineer, Commercial Truck Company of America.
C. B. Whittlesey, Factory Manager, Hartford Rubber Works Company.

The Electric Vehicle Division is a new Division of the Standards Committee created by the Council pursuant to a resolution passed at the last meeting of the Society. The purpose of the Division is to recommend engineering practice in connection with the design, construction, and operation of electric motor vehicles. A meeting is scheduled to take place March 31, 1914, for the purpose of organizing and laying out the work of the Division.

Summer Meeting

The time of the sessions of the Summer Meeting of the Society, to be held at Cape May, N. J., has been fully determined by the Council, as follows:

TUESDAY, JUNE 23
2.00 P. M.—Standards Committee meeting.

WEDNESDAY, JUNE 24
2.00 P. M.—Business and professional sessions of the Society.
8.00 P. M.—Entertainment by Sections of the Society.

THURSDAY, JUNE 25
9.30 A. M.—Professional Session.
2.00 P. M.—Professional Session.
8.00 P. M.—Dinner and European Trip Lecture.

FRIDAY, JUNE 26
9.30 A. M.—Professional Session.
1.00 P. M.—Adjournment sine die.

The meeting will be held in the new Cape May Hotel, a beautiful fireproof structure situated right on the beach and having accommodations for six hundred guests. Special rates on the American plan have been obtained.

In connection with the hotel there are facilities for golf, tennis, fishing, boating, bathing, etc. The hotel operates its own garage, which is equipped for charging electric vehicles as well as for caring for and supplying the needs of gasoline machines. The harbor at Cape May is excellent, and yachts or motor boats can obtain good anchorage therein.

Members can obtain full information about the hotel by addressing James E. Galbrey, Manager, Hotel Cape May, Cape May, N. J.

The wives and children of members will be most welcome at the Cape May Hotel during the time of the meeting. Special arrangements for their comfort and entertainment will be provided, such as afternoon tea, dancing with instructor in attendance, etc. Members can be assured that their families will thoroughly enjoy attending the meeting, and are urged to bring them with them. It is the wish to have the children on hand. Play space equipped with swings, roller coasters, etc., will be provided for indoor recreation, as well as beach games, with competent maids in attendance.

Full particulars of the meeting will be furnished the members in due course.

The Meetings Committee would like to have as many suggestions as possible from the members as to subjects of papers for presentation at the various professional sessions of the meeting. Address Arthur B. Cumner, Chairman of the Meetings Committee, S. A. E. office, 1790 Broadway, New York City.

The General Committee on Arrangements will also welcome suggestions as to the conduct of the meeting. Address this committee at S. A. E. headquarters.

TO GIVE NEW YORK BETTER TRAFFIC CONDITIONS

The Committee on Public Thoroughfares of the Board of Aldermen of New York City has appointed eight men who have an intimate and practical knowledge of traffic conditions and problems to act as an advisory board in draughting the measures which it contemplates for the betterment of traffic in that city. The board is to undertake a thorough investigation of traffic conditions as regards congestion, safety, and the proper traffic regulation, with the idea of suggesting ways and means of adjusting matters to the best advantage to all forms of traffic, both animal and power vehicles and to pedestrians.

Five of the eight members appointed are members of the recently-formed Citizens' Street Traffic Committee of Greater New York, organized for independent study of traffic conditions and problems. These members are George H. Pride, of the Heavy Haulage Company; Robert Grier Cooke, of the Fifth Avenue Association; J. K. Orr, of the Team Owners' Association; E. P. Goodrich, engineer of the Borough of Manhattan, and Samuel W. Taylor, of the Uniform Motor Vehicle Legislation Commission. In addition, James A. Blair, Jr., John C. Eames, and Alexander R. Piper have been asked to serve. Louis Graves, examiner to the president of the Board of Aldermen, will act as secretary to the new board.

Universal Motor Truck Company, Detroit, has sold its Chicago branch to Wm. A. Schaefer and F. H. Luther, who will do business under the name of the Chicago Universal Motor Truck Company.

W. S. Pettit, formerly sales manager of the Commerce Motor Car Company, has severed his connection with that concern. He resigned the advertising managership of the Studebaker Corporation to connect with the Commerce company. He plans to re-engage in the trade shortly.

A. D. Trempe has become sales manager of the Mott Wheel Works, Utica, N. Y. The selling arrangement with R. B. Abbott Sales Company has been canceled, and Mr. Trempe will hereafter direct the sales of the company. The company has just closed an order for the wire wheels on Saxon cars.

The postmaster of Birmingham, Ala., is experimenting on motor delivery of fourth-class matter, and has installed one motor wagon. Others will be ordered if the experiment proves successful.

Extracts From Motor Vehicle Laws Pertaining to Weights and Speeds of Commercial Cars

From time to time we receive inquiries as to the attitude of motor vehicle laws regarding steel-tired trailers, front wheel driven trucks with steel rear tires, trucks with two-wheeled trailers, the forward end of which rests on the rear of a truck, etc. To tell the truth, the law makers have not made any special provisions as a rule for such vehicles, and we therefore give extracts from the various laws, so that our readers may see how far they cover such constructions.

EXTRACTS OF LAWS INSOFAR AS THEY APPLY TO STEEL-TIRED TRAILERS, FRONT WHEEL DRIVEN TRUCKS WITH STEEL REAR TIRES, TRUCKS WITH TWO-WHEELED TRAILERS, WEIGHT LIMITS, SIZE LIMITS, ETC.

PENNSYLVANIA.—"No motor vehicle shall be registerable which shall exceed 90 in. outside overall width of vehicle and load combined, except that motor busses for carrying passengers, to be used within the city limits only, in cities of the first, second, and third classes, may be registered up to 100 in. outside overall width of vehicle and load combined,—nor shall exceed a maximum of 24,000 lbs. gross weight of vehicle and load combined; or shall exceed 18,000 lbs. maximum gross weight of vehicle and load combined upon any axle; or shall exceed 750 lbs. maximum gross weight of vehicle and load combined upon any one wheel, for each nominal inch of width of solid tire upon the wheel.

"No motor vehicle, self propelled and equipped with metal tires shall be licensed, as aforesaid; but the owner shall, upon application to the Highway Commissioner, upon payment of a proper fee, be given a special license, subject to the rules and requirements to be established by the Highway Commissioner as provided by law.

"The Highway Commissioner shall not make restrictions prohibiting the use of traction-engines of less than 26,000 lbs., gross weight, and 100 in. in width over all, and equipped with metal cleats of a width of not less than 2½ in., and of a height not to exceed 1½ in., so placed on the drivers that not less than two cleats shall touch the ground at all times.

"No person shall drive a motor vehicle, having solid tires and weighing more than 5000 lbs., gross maximum weight of vehicle and load combined, at a greater rate of speed than one mile in 4 minutes; and no person shall drive a motor vehicle, having solid tires weighing over 15,000 lbs., gross maximum weight of vehicle and load combined, at a greater rate of speed than 1 mile in 5 minutes; and no person shall drive a motor vehicle, having solid tires and weighing over 15,000 lbs. gross maximum weight of vehicle and load combined, at a greater rate of speed than 1 mile in 6 minutes."

MASSACHUSETTS.—"No traction engine, trailer, motor or other vehicle shall be operated upon or over a highway or bridge in any city or town in this commonwealth, nor shall any object be moved over or upon any such highway or bridge, upon wheels, rollers or otherwise, in excess of a total weight of 14 tons, including vehicle, object or contrivance and load, without first obtaining a permit * * * from the authority or authorities therein mentioned; nor shall any vehicle be operated or contrivance moved upon or over said highways or bridges which has any flange, ribs, clamps or other object attached to its wheels or made a part thereof, which will injure, cut into or destroy the surface of the highway or bridge for any considerable depth; and in the towns of the commonwealth outside of the metropolitan parks or sewerage districts no such engine, vehicle, object or contrivance for moving heavy loads shall be operated or moved upon or over any such highway or bridge the weight of which resting upon the surface of said highway or bridge exceeds 800 lbs. upon any inch in width of the tire, roller, wheel or other object, without first obtaining said permit, unless such highway or bridge is paved with brick, block sheet asphalt, concrete pavement or surface. The owner, driver, operator or mover of any such engine, vehicle, object or contrivance over said highway or bridge shall, unless relieved from liability in said permit, be responsible for all damages which said highway or bridge may sustain as a result of said action on his part, and the amount thereof may be recovered in an action of tort by the authority or authorities in charge of the maintenance or care of said highway or bridge, or by the authorities of the town, the Massachusetts highway commission, or the county commissioners which have charge of the highway or bridge which is injured.

"No steam traction engine, with or without trailers, and no motor truck carrying a weight in excess of 4 tons, including the vehicle, shall be operated upon any highway or bridge in this commonwealth at a speed greater than 15 m.p.h.; and no such vehicle carrying a weight in excess of 6 tons, including the vehicle, shall be operated upon any such highway or bridge at a speed greater than 6 m.p.h. when such a vehicle is equipped with iron or steel tires, nor greater than 12 m.p.h. when the vehicle is equipped with tires of hard rubber or other similar substance.

"The Massachusetts highway commission, county commissioners, superintendents of the streets, selectmen, or road authorities having charge of the repair and maintenance of any highway or bridge in any of the towns in the commonwealth are hereby authorized, upon proper application in writing, to grant permits for the moving of heavy vehicles, loads, objects or structures in excess of a total weight of 14 tons over said highways or bridges, and for operating or moving over any highway or bridge in any town in the commonwealth outside of the metropolitan parks or sewerage districts, any engine, vehicle, object, or contrivance, the weight of which resting upon the surface of said highway or bridge exceeds 800 lbs. upon any inch in width of tire, roller, wheel, or other object, which permits when duly granted shall authorize such movement. Said permits may be general or may limit the time and the particular roads and bridges which may be used, and may contain any special conditions or provisions which in the opinion of the authorities granting the same are necessary for the protection of said highways or bridges from injury. The authorities that have charge of any such bridge are hereby authorized to make regulations limiting the speed of any of the vehicles mentioned in this act passing over said bridge to a speed not to exceed 6 m.p.h., provided that notice is conspicuously posted at each end of the bridge affected by such regulation and the load capacity of the bridge is stated therein.

"Any person violating the provisions of this act or the regulations made or permits granted under authority thereof shall be liable to a fine of not more than $100 for each and every offence, and said fines shall be paid into the treasury of the commonwealth for use on State highways or bridges when State highways or bridges are injured, and into the treasury of the city, town or county, for use on the highways of said city, town or county in addition to any other moneys that may be available for that purpose.

"Nothing in this act shall affect the provisions of section thirty-one or chapter fifty-two of the Revised Laws or shall authorize the passage of heavier vehicles or loads over bridges and highways than are now authorized by law, or in any way change or increase the liability of the commonwealth or of any county, city or town to pay for any damage or injury to any person or property."

NEW JERSEY.—"No traction engine, trailer, motor or other vehicle, except those exclusively running on rails or tracks, shall be operated upon or over a highway or bridge in this State, nor shall any object be moved over or upon a highway or bridge, upon wheels, rollers or otherwise, except those exclusively running on rails or tracks, in excess of a total weight of 25,000 lbs., including vehicle, object or contrivance and load, and without first obtaining a permit, * * * from the authority or authorities in charge of the maintenance or care of said highway or bridge; nor shall any vehicle be operated or contrivance moved upon or over said highways or bridges which has any flange, ribs, clamps or other object attached to its wheels or made a part thereof, which will injure or destroy the surface of the highway or bridge, nor shall any such engine, vehicle, object or contrivance for moving heavy loads be operated or moved upon or over any highway or bridge the weight of which resting upon the surface of said highway or bridge exceeds 800 lbs. upon any inch in width of the tire, roller, wheel or other object supported upon the surface thereof without first obtaining said permit. The owner, driver, operator or mover of any such engine, vehicle, object or contrivance over said highway or bridge shall, unless relieved from liability in said permit, be responsible for all damages which said highway or bridge may sustain as a result of said action on his part, and the amount thereof may be recovered by the authority or authorities in charge of the maintenance of care of the highway or bridge which is injured, in an action of tort.

"No steam traction engine, with or without trailers, and no motor truck carrying a weight in excess of 8000 lbs., including the vehicle, shall be operated upon any highway or bridge at a speed greater than 12 m.p.h.; and no vehicle carrying a weight in excess of 12,000 lbs., including the vehicle, shall be operated upon any highway or bridge at a speed greater than 8 m.p.h., when such vehicle is equipped with tires partly or entirely made of metal, nor greater than 10 m.p.h. when the vehicle is equipped with tires of other material than metal.

"The State Road Commissioner, or any county or municipal officer, or county or municipal board or body having charge of the repair and maintenance of any highway or bridge in this State, is hereby authorized, upon proper application in writing, to grant permits for the moving of heavy vehicles, loads, objects or structures over said highways and bridges, which permit when duly granted, shall authorize such movement. Said permits may be general or may limit the time and the particular highways and bridges which may be used, and may contain any special conditions or provisions which in the opinion of the authority granting the same are necessary for the protection of said highways or bridges from injury. The authorities having charge of any such bridge are hereby authorized to make regulations limiting the speed of any of the vehicles mentioned in this act passing over said bridge to a speed not to exceed 6 m.p.h., provided notice is conspicuously posted at each end of the bridge affected by such regulation.

"Any person violating the provisions of this act or the regulations made or permits granted under authority thereof shall be liable to a fine of not less than $10, nor more than $1000 for each and every offense, and said fines shall be paid to the Commissioner of Motor Vehicles for use on State highways or bridges when State highways or bridges are injured, and into the treasury of the county or municipality when any highway or bridge is injured which is under the care of such county or municipality, for use on the highways and bridges of such county or municipality in addition to any other moneys that may be available for that purpose."

Buffalo Electric Vehicle Company, Buffalo, N. Y., has inaugurated a body department in charge of E. E. Denniston.

Anderson Rolled Gear Company, of Cleveland, Ohio, has purchased the plant and property held under lease and option by them and formerly owned by the Cleveland Drop Forge Company.

Merchants' Motor Truck Manufacturing Company, Chicago, Ill., has been incorporated. Capital stock $100,000. Wm. Schulze, Joseph W. Misek and Clayton A. Martin, incorporators.

Keller Cyclecar Corporation has been incorporated under the laws of Delaware with a capitalization of $250,000, for the manufacture of cyclecars, motor trucks and aeroplanes. The incorporators are lawyers of Wilmington, Del.

Purified Petroleum Products Company, Cincinnati, Ohio, has been organized to manufacture a new form of gasoline. A plant will be erected on Carthage Pike, Elmwood Place, costing $300,000. It is proposed to produce 50,000 gallons of gasoline daily.

The Motokart Company has recently been incorporated in Trenton, N. J., and has taken over the Tarrytown Motor Car Company and the Steinbock Engineering Company, Inc. The new company will be capitalized at $500,000, and will push the manufacture of Motokart parcel delivery cars on a considerable increased scale.

Motor Appliance Sales Company, Limited, Detroit, Mich., has obtained the exclusive American rights to the steering gear patented by Theopolus Mayhew.

THE COMMERCIAL CAR JOURNAL

Vol. VII. PHILADELPHIA, MARCH 15, 1914 No. 1

Published the 15th of each month by the

CHILTON COMPANY

Market and 49th Streets Philadelphia, U. S. A.

JAMES ARTMAN .....President
GEO. H. BUZBY.....Vice President
C. A. MUSSELMAN.....Treas. and Gen'l Manager
A. H. VAUX .....Secretary

ADVERTISING DEPARTMENT

Western Manager.....C. C. McKINNEY, Chicago
Eastern Manager.....C. MONROE SMITH, New York

EDITORIAL DEPARTMENT

JAMES ARTMAN.....Editor-in-Chief
E. S. FOLJAMBE.....Managing Editor

ASSOCIATE EDITORS

ALBERT G. METZ J. HOWARD PILE

SUBSCRIPTION RATES

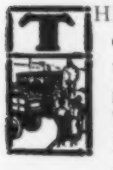
United States and Mexico..... One Year, $1.00
Other Countries in Postal Union, Including Canada..... One Year, $2.00

Make checks, money orders, etc., payable to Chilton Company.

Change of Address—Subscribers desiring their address changed, should give the old as well as the new

Entered as second-class matter at the Post Office at Philadelphia, Pa., under the Act of March 3, 1879.

ANTI-SKIDS: A PROBLEM FOR THE MAKERS



THE paramount importance of some form of anti-skid device for every commercial car during winter weather was brought home to truck users with no gentle hand during the recent blizzards experienced by New York, Philadelphia, and other eastern cities. Pieces of rope, chains, and make-shift attachments were put on the wheels in a desperate attempt to give the vehicles traction. Many users had not provided themselves with anything whatever for such an emergency, and consequently had their own troubles, especially if the cars were in the hands of inexperienced operators.

The deplorable lack of anti-skid devices for commercial cars was never more forcibly brought to the attention of both manufacturers and users than during the early part of March. The question has been asked the writer by users, "Why is it that the manufacturers do not realize the importance of supplying some form of anti-skid device for their vehicles?"

This question of efficient anti-skids has been uppermost in the mind of many truck users during the past month. It is a question which must soon be answered, and it is realized that it is a difficult question to answer. The designer is "between the devil"—*tearing the tires to pieces*—"and the deep sea"—*hammering the truck to pieces*, when operating on anything but a soft surface. Most anti-skid devices take so long to apply that the drivers will not put them on and take them off as required. Those which do not creep or change their position at all on the tires often ruin an expensive set of tires in two or three days. If they creep too much the wheel will turn within the anti-skid device, and it is not effective. Any and all of them damage the tires to a certain extent, and when driven continuously with them to a much greater extent.

The writer has noticed trucks running at 10 to 12 m.p.h. in which the wheels were actually bumped off the pavement as each anti-skid cross piece came in contact with the ground, causing a rapid succession of hammer blows which jarred the vehicle to its core. Running under such conditions invariably results in breakage, and rapid deterioration of the entire equipment.

Many of these devices will not stand the strain for even a few days, often being put out of commission by a single trip. The chains stretch rapidly, and when worn are dangerous on chain driven trucks, damaging the mud-guards, knocking off grease cups, etc. Of course, this can be prevented by replacing them, but careless drivers often neglect to do this.

There is a very growing and insistent call for a satisfactory solution of the anti-skid problem. To no one is it more important than to the manufacturers themselves. It is suggested that the makers set their engineering departments at work on this question with the hope that some satisfactory solution of the difficulty may be reached before winter is upon us again.

IMPORTANCE OF THE ADVERTISING MANAGER

SUCCESSFUL business heads, realize the importance in the organization of the advertising manager. In small establishments his importance is all too often overlooked. His duties are assigned to someone who already is acting in perhaps more than one capacity with the usual result,—total lack of efficiency. Not so in the larger concerns where each class of work is under the direct and personal supervision of a competent head. In such establishments the advertising manager is recognized as an all-important factor in the success of the business. With him advertising is a science, a thing to be studied, effects analyzed, results tabulated and future methods based on this study.

Such a man never regards or thinks of advertising as a necessary evil, or a matter of charity. He never confers an advertising contract on the charity basis but always with the one and sole purpose of obtaining value received for his money. He knows that advertising is a legitimate and essential detail of the business. It is never a graft game. He believes in purchasing advertising the same as he purchases anything else; he gives it out in a business-like way and he never handles his employer's money as if it were his own, to cement personal friendships with good fellows who are his friends among publishers.

He realizes that he is purchasing a definite thing for his company, that in a sense he is a purchasing agent, the only difference between his position and that of the ordinary purchasing agent being that it is much more difficult for him to know where to purchase and in many cases almost impossible to definitely analyze and weigh the results of his purchase. Nevertheless, he catalogs as far as possible all the returns which can be definitely attributed to certain publications, these known results are classified, and the *cost per sale* in different mediums is known.

As time goes on, his knowledge of the mediums pertaining to his particular line of trade, increases and eventually he knows definitely where to purchase advertising. He buys advertising for his company with the same definiteness as the purchasing agent buys iron, steel, leather, or other raw materials, which enter into the manufacture of the company's product. Knowing the importance of buying where returns will result, he never places business on any but a business basis. He never feels that because there are, say fifteen publications pertaining directly to his industry, that it is his duty to distribute the moneys which are entrusted to him among these trade papers, but having analyzed the situation, he buys where the cost per sale is the lowest.

The advertising manager who conducts his department as we have outlined, is never a man who feels or acts that he is doing a favor to anyone by placing a contract with him. He does not sign a contract and hand it over to the solicitor with an air of, "now I have done you a favor, don't forget it." He appreciates that he has made a purchase, the importance of which may be even greater to his company than many of the investments of the purchasing department. He realizes that he is not giving anything, because from experience he has found that definite returns commensurate with his expenditure will result.

We believe that the advertising manager has it within his power to contribute much to the success or failure of his company. Feeling this to be true, we are pleased to note the ever-increasing number of men in such positions who realize that advertising is a real and vital detail of modern big business, and are systematically studying and analyzing results from the publications which they use.

Steel and Rubber Markets

Demand for Steel Lighter

Although the demand for steel continues light, prices remain about stationary. The consummation of heavy steel pipe contracts in February counteracted smaller buying of other products as far as steel corporation is concerned. Steel building work is smaller. Quotations on March 9th were:

STEEL PRODUCTS PRICES

Bessemer steel, per ton, mill	21 00	a	21 50
Open hearth, per ton, mill	21 00	a	21 50
Steel bars, per ton	22 00	a	22 50
Steel bars, soft base, half ex tidewater	1 36	a	1 41

The above prices are at tidewater in carloads and larger lots. For quantities less than 2000 lbs., but not under 1000 lbs., $2 per ton additional is charged and less than 1000 lbs., $8 per ton additional.

SHEETS

The following prices are for 100-bundle lots and over f. o. b. mill; smaller lots $2 per ton higher.

Gauge—	Black.	Galvanized.	Gauge—	Black.	Galvanized.
Nos. 22 & 24	1 80	2 10	No. 28	2 00	3 00
Nos. 25 & 26	1 85	2 80	No. 29	2 05	3 05
No. 27	1 90	2 90	No. 30	2 10	3 25

IRON AND STEEL AT PITTSBURGH

Bessemer iron	15 15	a	.....
Bessemer steel, f. o. b. Pittsburg	21 00	a	21 50
Muck bars	28 00	a	29 00
Skelp, grooved steel	1 20	a	1 25
Skelp, grooved iron	1 55	a	1 60
Ferro-manganese (80 per cent.), seaboard	39 00	a	.....
Steel, melting scrap	12 00	a	13 00
Steel bars	1 15	a	1 25
Black sheets, 28-gauge	1 95	a	2 00
Galvanized sheets, 28-gauge	2 95	a	3 00
Blue annealed, 10-gauge	1 40	a	1 45
Tank plates, ¾-in. and heavier	1 20	a	1 25

Rubber Supplies Increase, Prices Drop

Increases in shipments of all classes of crude rubber and a quiet trading condition combined to force rubber prices down considerably below the figures for last month. The word's visible supply of Brazilian rubber showed an increase during February of 2120 tons. Quotations on March 9th were:

Up-River—			
Fine	73	a	..
Coarse	44	a	..
Island—			
Island, fine	68	a	69
Course	32	a	33
Cameta	35	a	36
Caucho—			
Balls	45	a	46
Centrals—			
Cerinto	42	a	..
Esmeralda	42	a	..
Guatemala, slab	38	a	..
Mexican—			
Scrap	42	a	43
Strips and scrap	40	a	41
Guayule	Nominal		
Balata, sh't	64	a	66
Ciudad, b'k	48	a	..
Trinidad, b'k	Nominal		
Africans—			
Massai, red	47	a	..
Red C'go	Nominal		
B'k C'go	47	a	..
Soudan—			
Niggers	Nominal		
Gambia, prime	44	a	..
East India—			
Smk, sh'ts	58	a	59
Ceylon, bis and sheets	57	a	58
Pale crepe	58	a	59
Pontianac—			
Prime plantation	6	a	..
Palembang	6	a	7

DOMESTIC SCRAP RUBBER

Boots and shoes	6¼	a	7
Tires—			
Automobiles	4½	a	..
Bicycle, pneumatic	2½	a	3
Wagon and carriage, solid	4½	a	4¾
Inner tubes	16	a	17

STEGEMANS FOR EXPRESS SERVICE

The Public Service Express, Inc., New York City, have placed an order with the Stegeman Motor Car Company, Milwaukee, for fifty of its trucks; twenty-four one-ton and two three-ton for immediate delivery, and delivery dates for the balance to be specified later. The Public Service Express, Inc., is a company organized by some twelve department store heads who have determined to solve the delivery question for department stores by installing motor trucks and combining the deliveries of these stores. With the plans as outlined, they feel assured of success, and the Traffic Managers of these big stores can now feel that all their delivery problems will be properly taken care of.

The Austrian military authorities have postponed the closing of the entry list for their International Military Motor Wagon Tire Competition until next summer, it being the intention, formerly to close the list on October 1st, of last year. The list will now remain open until June 30th. Entries are to be sent to the Automobil Versuchs, Abtherlung 1 Gumpendorfer strasse, Vienna, VI.

A new use for a motor truck was found recently, in Los Angeles, Cal., when the high waves threatened to tumble a two-story house, which faces the ocean front south of Venice. House movers were called in and the structure was raised on rollers and moved to the back of the lot, but the water continued to come up. At this point, Ned E. Cutting, driving a Standard truck, took in the situation, backed up the truck and coupled it to the rollers and moved the house to safety.

Seven motor trucks carried about 200 men to the Court House at San Antonio, Tex., to pay their poll taxes in order to make sure of a large registration.

The Fire Department of Los Angeles, Cal., has added six Moreland combination hose and chemical trucks to its equipment.

VISITORS TRUDGE THROUGH FOOT OF SNOW TO SEE TRUCKS AT PITTSBURGH

The fourth annual show of the Pittsburgh Auto Show Association was put on at the big Exposition building at the Point Saturday evening, February 14. In spite of the zero weather and the fact that snow was more than a foot deep on city streets, there was an attendance of about 4500. The 1914 show is particularly interesting from the number of commercial cars on exhibition. In all there were twenty-five trucks shown, a large number of these being big trucks actually in use at present by companies in different towns of western Pennsylvania, eastern Ohio and West Virginia, and for this reason they are attracting much more than the usual interest from prospective truck buyers. Trucks on exhibition were: Bessemer, Studebaker, Four-Wheel-Drive, Stewart, Commerce, I-H-C, Little Giant, Lange, Republic, Shelton, Standard, Motokart, Kelly, Chase, and Velie.

The Show Committee made extra effort to attract to this show a large number of wholesale and retail merchants and manufacturers who are taking more and more to trucks every year. The opening night showed an exceptionally large proportion of these business men among the attendants.

TRUCKS EXHIBITED AT BUFFALO

That interest in commercial cars is far from dead, despite the discontinuance, for the time being, of the national shows in New York and Chicago, is shown by the success of the second section of the twelfth annual show of the Buffalo Automobile Dealers' Association, which closed on February 14. The commercial car section which was in the limelight during the second section brought out trucks in greater numbers than have ever before been shown in a Buffalo show. Among the trucks shown were the Atterbury, Brockway, Buffalo electric, Vulcan, I-H-C, Lippard-Stewart, Little Giant, Overland, Willys, Packard, Pierce-Arrow, Stewart, Tiffin, Velie and Peerless. Some of these were shown in several models.

COMMERCIAL CARS AT ST. LOUIS AUTOMOBILE SHOW

Commercial cars seemed to hold the center of the stage at the ninth annual St. Louis automobile show at the Coliseum recently. The commercial cars had their innings each day and most of the sales were of delivery cars and heavier trucks. This show, conducted by dealers who are barred from exhibiting at shows of the St. Louis Automobile Dealers' and Manufacturers' Association, is on the co-operative plan, the profits being equally divided among the exhibiting dealers. The following makes of commercial cars were on exhibition: Palmer, Speedwell, Little Giant, Menominee, Republic and Mogul.

NEWARK HAS GOOD SHOW

The Newark, N. J., automobile show was practically a State affair, being promoted by the New Jersey Automobile Exhibition Company, made up of a State-wide membership of dealers. Thursday, February 26th, was designated as Commercial Car Night and all members of the Motor Truck Club were invited to attend. Trucks on exhibition were: Buick, Walter, Morton, Peerless, Overland, Willys, Adams, Velie, Pierce-Arrow, Koehler, Selden, Reo, Stewart and Garford. The show closed on February 28.

NO TRUCK SHOW IN KANSAS CITY, BUT DEALERS ARE NOT ASLEEP

Co-operating in a common cause, truck dealers in the Kansas City district are conducting an educational campaign in lieu of a truck show, during the passenger vehicle show. The method is to direct the persuasive energies of the advertising and talks that are being conducted to the promotion of truck use in general, without reference to particular makes. Dealers for the following makes have entered into the co-operative campaign: Baker electric, Buick, Peerless, Federal, G. M. C., Overland, Willys, Jeffery, Kelly, Kisselkar, Packard, Pierce-Arrow, Reo, Studebaker, White and Wilcox.

AUTOMOBILE SHOWS AT WHICH COMMERCIAL CARS WILL BE EXHIBITED

March 14-21—Harrisburg, Pa. Arena and Rex Garage. Harrisburg Auto Dealers' Association.

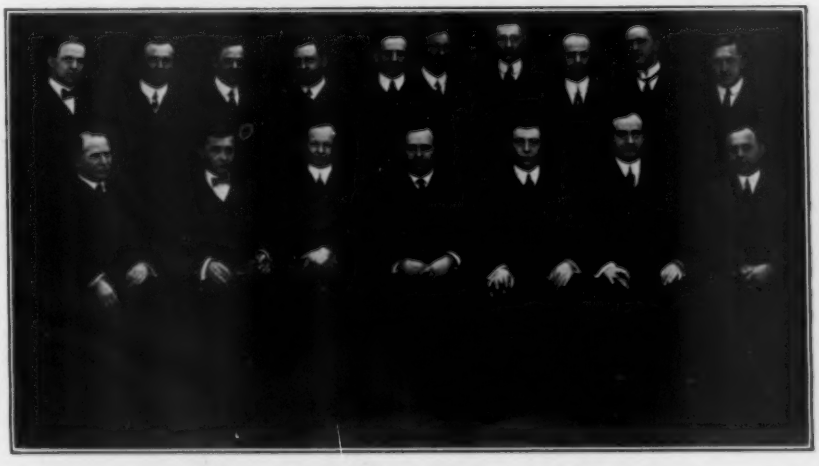
March 17-21—Boston, Mass. Boston Commercial Motor Vehicle Association. C. I. Campbell, Secretary.

March 23-30—St. John, Canada. New Brunswick Auto Association. E. M. Wilcox, manager, 62 Temperance Street, Toronto.

April 9-15—Manchester, N. H. Mechanics' Hall. D. F. Sullivan.

May 4-9—Deadwood, S. D. Auditorium. George D. Kilkes.

Dealers in Federal trucks, representing Boston, New York, Providence, Hartford, Bridgeport, Philadelphia and Baltimore, have joined together in an important step of making inter-city transportation by motor truck both practical and economical. The Eastern Federal Dealers' Association is going to solve the problem from both the seller's and buyer's standpoint. Every Federal dealer has bound himself to give every Federal owner the same attention, whether the truck was bought from him or from another dealer several hundred miles away. The owner does not have to bear the cost of this service either on the purchase price or after. A Federal owner can now start out from Boston to deliver his goods all the way to Baltimore, and hardly be out of sight of a Federal dealer's service station along the whole route.



A Combined Splitdorf-Apple Selling and Distributing Force

The recent reorganization of the Apple Electric Company, of Dayton, Ohio, by the Splitdorf Electrical Company of Newark, N. J., was followed by a "sales policy" meeting of executive and branch-house heads of the Splitdorf and Apple outfits, held in Dayton, Ohio, an illustration of which is shown above.

How One Agent Woke Up

His New Policy and How It Worked

By D. E. SCRIBER

REED was in a fretful humor. Things had been going from bad to worse, he had just had a stormy interview with Young, a contractor who was one of the largest users of the truck which he was handling. To tell the truth, Reed was not only nettled almost beyond endurance by the attitude of the contractor, but he was discouraged. It seemed to him as though everything was conspiring to make it impossible for him to make any profit.

While in this state of mind, Lawrence, the head salesman, who was financially interested, just returned from a trip, grasped Reed by the hand, instantly noting that something was wrong. "Well, what's up?" said Lawrence, "it isn't often I see you looking like a gray day with a storm on the horizon?"

"Oh, everything, it's all up, I guess. You know we have just about been breaking even for the last two years, in fact haven't broken even for the last two months."

"Oh, cheer up," said Lawrence, "things are looking brighter, and I have talked with a number of men in the trade, and they all agree that conditions are improving."

"Something's got to improve mighty quick, or else we are going out of business," said Reed, with a most disgusted and dejected look. "We've done our best to please our customers, we done everything for them that any human being could expect, and yet a man like Young comes in here and pushes our bill under my nose, that I have been trying for a year to get him to pay, and arbitrarily says, 'I won't pay that, and that, and that,' checking items off the list. Now, every one of them are legitimate items, and we have carried him over all kinds of troubles that weren't our fault nor the fault of the truck, and then he throws it up to me that we can't afford to have him dissatisfied, it wouldn't look well to our other prospects."

"That's just it," broke in Lawrence, "we've done too darn much for our customers, the more you do for them the more they expect you to do. I just had a talk with Johnny Wilkins, and he's come to the same conclusion that I have; we're a bunch of dubs to be doing repairs, making adjustments, loaning trucks, and virtually carrying the responsibility of the entire fleet of some of our users without charging them a cent. I've made up my mind there's only one way out of it, and that is to make them pay for every item that they should pay for, just the same as is done in any other line of business."

"Well! if you do that, they'll make an awful howl, and queer our sales with others that we've been working on here for a year. There's the match company, and the Goodman Lumber Company, both of them have been watching Young's trucks. Young even had the face to threaten to sell his entire outfit, if we pushed him too hard."

All right, let him! fairly hissed Lawrence with that determined bulldog set of the jaw which bespeaks the fighting spirit. There's a limit! If he gets anything more out of us for nothing, we deserve to fail."

"Perhaps you're right," said Reed, "we can't be much worse off than we are, and I'm perfectly willing to take a chance. I've gotten to the point where I feel like telling them all to go to blazes, especially fellows like Young. I'll tell you what we'll do, we'll get the boys together and talk this over, and start out on a new basis."

The result of the meeting, as might be expected, was an unanimous decision to collect from those that they could, and from that time on have it distinctly understood that they would charge for every service which should legitimately be charged for. As Reed said, "we have a fine service department, there isn't a company in the city that is better able to take care of its customers than we are, yet that department has been losing money every day. From now on it is going to show a slight profit, if we have to keep on increasing the charge per hour until we go out of business."

"This man had a spring break," said Lawrence, pointing to a receipted bill on the table. "The same thing happened once before, and we made it good. Of course, he expected us to do it again, but I explained the situation and that we couldn't go on forever keeping up his machines. He put up an awful kick, but finally paid it."

This was the beginning of the new order of affairs. Much to the surprise of Reed, after a stormy interview with certain of his customers, they paid their bills.

Young threatened to sell his whole fleet. Reed laughed as he told of the circumstances. I told him, "of course we'd dislike very much to lose him as a user, but if he wasn't getting service out of the trucks, and the cost was greater than the conditions would warrant, and really felt that he'd have to sell them, we'd do everything in our power to help him dispose of them with as little loss as possible."

"You should have seen the look he gave me. The old hypocrite, he knew he was getting all that any man could expect, and you just bet he hasn't said a word about selling the trucks since. More than that, he was in here just yesterday to have a radiator repaired. His man had been trying to push a scaffolding over with it from its looks. We put him in shape, but had to work all night on it, and we'll get the money, for he knows now he can't put across any more bluffs such as we've been fools enough to stand for ever since we started."

"Say, this is some salesroom," ejaculated Lawrence, as he looked over the new quarters into which they had just moved. He couldn't refrain, but had to let it out, "I told you so, a year ago, now didn't I?"

"Yes, you were right," responded Reed, "our policy is certainly responsible for this new place. We'd have been down and out in less than six months if we'd kept on at the old gait."

At this juncture the phone rang. "What's up?" said Lawrence, as he listened to the one-sided conversation. "We'll put the job through, and have the car on the road by eight to-morrow," said Reed, "send it over."

"There you are," said Reed, as he leaned back after hanging up the receiver, "that was Young. What a change. He wants us to take down the rear axle assembly on his number three, overhaul it and put it in again, and says he doesn't care what it costs, so long as we get it on the road by eight to-morrow morning. Says he knows we won't overcharge him, and that the work will be done when we say it will, if we promise. Lawrence, that's service. He pays for it; we make something on the job; and he isn't held up."

ELECTRIC TRUCK DON'TS

By the New York Edison Company

DON'T try to accomplish as much in the snow as you have on clear asphalt.

DON'T start out in the morning until you are satisfied that your battery has been fully charged.

DON'T try to push a drift ahead of you. Leave it for the snow contractor.

DON'T sit still while the wheels go 'round in the slush. Have a box of sand and a kitchen coal shovel handy. Use sand liberally. It is cheaper than electricity.

DON'T throw your power on full. Work it up gradually not forgetting the sand box.

DON'T forget an anti-skid device. An improvised one may be made by looping three or four turns of a rope around your tires.

DON'T forget that time may be gained by leaving your wagon at the corner and making side street deliveries on foot.

DON'T let your truck stay out all night for want of a boost. The New York Edison Company has twenty-four emergency charging stations in New York where your firm's credit is good.

DON'T lay this aside until you have learned its lessons.

Goodyear Tire & Rubber Company's stockholders approved the plan for introducing $4,000,000 of new working capital by the sale of stock. Present stockholders have already subscribed for more than 805 shares of the stock to be offered. The approval of the financial plan puts the Goodyear Company in first-class shape for expanding business.

Brown & Robb Company, Gloucester, N. J., has been formed with a capitalization of $100,000 to manufacture automobiles, motor trucks and wagons.

Dayton Rubber Manufacturing Company, Dayton, Ohio, proposes to raise its capital stock from $150,000 to $1,000,000.

Agency Opportunities

Under this heading we publish each month dealers or prospective dealers who desire to take agencies for commercial cars. Dealers desiring to take advantage of this department should send in their names and addresses to the Editorial Department before the 5th of the month. This service is entirely without charge. Notices will be repeated only upon written request. Manufacturers when writing these firms will confer a favor by mentioning this journal.

Crown: Crown Commercial Car Company, Milwaukee, Wis. Open territory in New York City, Boston, Philadelphia, Buffalo, San Francisco, Los Angeles and other principal cities.

Crawford: Crawford Automobile Company, Hagerstown, Md. Open territory in New England, Northern New York, Central Pennsylvania, Middle West and Northwest and Southern California.

Trabold: Trabold Truck Manufacturing Company, Johnstown, Pa. Open territory in Pennsylvania except Cambria, Somerset, Blair and Indiana counties.

Koehler: H. J. Koehler Sporting Goods Company, 1709 Broadway, New York City. Open territory in San Francisco, Oregon, Nebraska, Atlanta, Ga., New Orleans, La., Galveston, Tex.

Mercury: Mercury Manufacturing Company, 4110 S. Halstead Street, Chicago, Ill. Open territory in St. Paul and Minneapolis, Minn., Milwaukee, Wis., St. Louis, Mo., Cincinnati, Ohio.

Bessemer: Bessemer Motor Truck Company, Grove City, Pa. Open territory in Texas, Oregon, Washington, Georgia, Alabama, Kansas, New York City, Baltimore, Md., St. Louis, Mo., Cincinnati, Ohio.

NEW "J-M" SERVICE STATION IN MILWAUKEE

H. W. Johns-Manville Company's Milwaukee branch has opened an auto service station at 96 2nd Street. The main floor garage accommodates eight automobiles at one time, and the mechanical equipment consists of all the necessary apparatus and tools to make repairs in auto accessories, including a calibrating machine for testing Jones Speedometer heads. A complete line of parts for the Jones Speedometer, Long Horn, Carter Carburetor and other J-M Accessories will be carried in stock. A large salesroom for the display of the J-M Auto Accessories occupies a portion of the front of this building, while the upper floor is laid out as a stock room of large proportions.

Gerlinger Motor Car Company, Portland, Ore., has sent out to its dealers and sub-agents in Oregon, Washington, and other points, a new method of selling cars whereby those who desire to buy pleasure cars or trucks, and cannot afford to pay for them in one payment, can be accommodated. The Gerlinger Company will buy from its responsible agents the notes given them by customers in part payment of the vehicles sold on part credit. The company buys the notes at the same time as the car is sold so that the dealer avoids the trouble of renewing short time notes, and does not run the risk of being asked for payment at an inconvenient time. The company makes a nominal service charge.

Personal Items

W. P. Abbey, has been appointed truck salesman of the Gerlinger Motor Car Company, Portland, Ore.

P. B. Talbott, formerly manager of the Dallas branch of the Firestone Tire & Rubber Company, has become manager of the Cleveland branch.

T. Barney Kennard, formerly manager of the Swinehart branch, Cleveland, has gone with the City Auto Tire & Supply Company, 1200 Huron Road.

Harper, D. Walter, 2534 N. Broad Street, Philadelphia, Pa., until recently handling pleasure cars, has made a change and will hereafter handle the Koehler truck.

W. E. Dermoty, who has been connected with the Goodyear factory force, in Akron, for several years, has been appointed manager of the company's Nashville, Tenn., branch.

J. G. Gass has become manager of the Swinehart Tire & Rubber Company's Cleveland branch, with headquarters at 6545 Euclid Avenue. He will travel through eastern Ohio.

C. M. Purdy, at one time connected with the Seattle branch of the Firestone Tire & Rubber Company, joined the Firestone factory branch on West Park Street, Portland, Ore.

H. J. Galvin, who has been connected with the Remy Electric Company, for several years, has been appointed manager of the San Francisco branch of that company, succeeding P. E. Kempton.

Gentry Clark, formerly assistant manager of the R. & L. Company's Boston branch, has been appointed sales manager of the Little Giant Truck Company, Pope Building, 221 Columbus Avenue, Boston, Mass.

S. S. Toback, President of the Ranney Company, New York City, in order to protect his company from liability in selling used cars, mortgaged or incumbered in any way, has gotten out a contract which the owner of the used car has to sign certifying that there is no lien, claim, debt, mortgage or incumbrance of any kind or description on said car, and that the same is free and clear. Mr. Toback recently had a narrow escape when he bought a car which was mortgaged and offered it for sale. It was only through accident that this fact was discovered. After the car was sold the money was retained, instead of being forwarded to the owner. The amount due on the mortgage was deducted from the amount received for the car, the matter adjusted satisfactorily. It is for this reason that he has taken the precaution of having owners of used cars certify to the above facts.

In Cleveland the manager of the public markets has a plan whereby motor wagons are to deliver market purchases at the rate of 3 cents a basket. He wants the City Council to authorize him to purchase and install a number of small motor wagons for this purpose.

Branch and Agency News

Mogul Truck Sales Agency, St Louis, Mo., has taken the agency for the Mogul truck.

Smith, W. L. Company, Washington, D. C., has taken the agency for the Motokart.

Kelly-Springfield Motor Truck Company's local branch, as moved to 2330 E Street, Tacoma Wash.

Rouze, C. F., 1733 McGee Street, Kansas City, Mo., agent for Krit cars, has added the Mack and Saurer trucks to his line.

White Company, Cleveland, Ohio, has opened branch at 33-35 William Street, Newark, N. J., for the sale of trucks and cars.

Jeffrey Auto Sales Company, San Francisco, has opened a branch at 16th & Alder Streets, Portland, Ore., in charge of H. A. Burgess.

Willys-Overland Company, Toledo, Ohio, has established a branch at Hamilton, Ont., Canada, to be known as the Willys-Overland Company of Canada, Ltd.

White Motor Company has opened a branch at 33-35 William Street, Newark, N. J., which is under the jurisdiction of the White Company's New York City office.

Benz Automobile Sales Company, New York City, a new company is to take over the agency for Gaggenau trucks. Among the officers of the new company are Russel L. Engs and Paul V. Clodio.

The Debo Transfer Company, 42-44 17th Street, Buffalo, N. Y., will consider taking on the agency for a reliable commercial car. This company has great facilities for demonstration in connection with its transfer business.

H. W. Johns-Manville Company has moved its Indianapolis, Ind., and Louisville, Ky., branches to larger quarters. The new address of the Indianapolis branch is 408-10 N. Capitol Avenue, that of the Louisville branch, 659-61 South Fourth Avenue. Both of these branches will include ample warehouse room, in addition to show rooms.

BOOK REVIEW

D. Van Nostrand Company, of New York City, has recently published a work by H. E. Wimperis, M.A., M.I.E.E., entitled "The Principles of the Application of Power to Road Transport."

In this work is taken up in five chapters the various phases of the application of power to road transport, measurement of power, of speed and resistence, torque efficiency, loss of power in the engine and in transmissions are dealt with, and special accelerometers described. Tractive effort curves are shown, as well as the relationship of engine dimensions, and gear ratios to the work to be done. The design of vehicles to be propelled by internal combustion engines or steam engines, is also considered. Electric and petrol electric systems are also dealt with. The book contains 130 pages, and sells for $1.50.

Associated Oil Company, Los Angeles, Cal., has bought fifteen Peerless trucks.

Means of Preventing Nuts From Turning

ALTHOUGH nearly everyone connected with the industry knows the use of the castellated nut and cotter pin, there are several other methods of accomplishing the same results obtained by the utilization of these articles, and these methods are not nearly as well known. Among these are spring washers, of which there are a great variety. The use of these cheap and effective devices adds greatly to a truck's life by preventing the different parts from becoming loose and finally lost.

One of the simplest is that put out by the Reliance Manufacturing Company, of Massillon, Ohio. It is a nice looking little piece of work, and made of the best spring steel, carefully tempered and made to a standard size.

Another type is the Positive, made by the Positive Lock Washer Company, of Newark, N. J. It differs from the plain spring washer only in that the ends are turned up very slightly, and are sharpened, so that when the nut is screwed down tight, one point digs into the nut and the other digs into the metal the washer seats on. They provide a sort of double lock. And no spring lock washer ever harmed a nut or a bolt thread; that's worth writing down and remembering.

Then there is the ribbed pattern of spring lock washer which is designed to do the same thing in a different way. The washer is put in place with the rib uppermost. Consequently, when the nut is screwed down, the rib—and all the rest of the washer, as well—being made of hardened and tempered stock, and therefore harder than the ordinary nut, forces a small part of the metal off the nut into the threads and in this way locks the nut securely. The Hobbs Company produces a washer of this type in which only about half of the end is formed into a barb.

In the locking arrangement produced by the O. K. Nut Lock Company, of Providence, R. I., there is a spring washer with the ends formed to fit into little depressions formed in the nut and in a supplementary washer which is keyed to the bolt, the bolt being slotted. The spring in the washer takes up for wear or slight elongation of bolts and the corrugations in the bolt head and the supplementary washer prevent the nut turning in the event that it should become very loose.

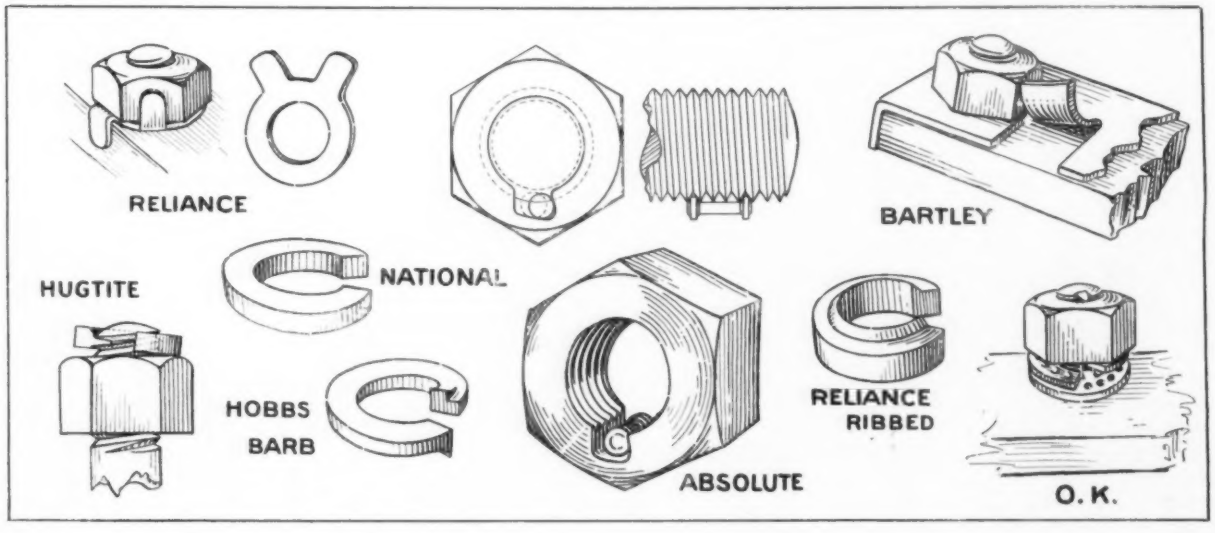
Somewhat different is the lock nut produced by the Columbia Nut & Bolt Company, of Bridgeport, Conn. This company believes that no commercial nut is a perfect fit upon the threads of its bolt, and so proceeded to produce a nut that does fit every bit of thread. The nut is virtually a double one. The nut proper is split and tapered on the outside and fits into an outer shell which is tapered inside. Consequently, when the nut is screwed home, the inside part, sliding on the shell, draws the threaded part together and literally forces the threads of the nut into perfect contact with the threads of the bolt. It's simple to get the nut off, too, and it does not harm the threads.

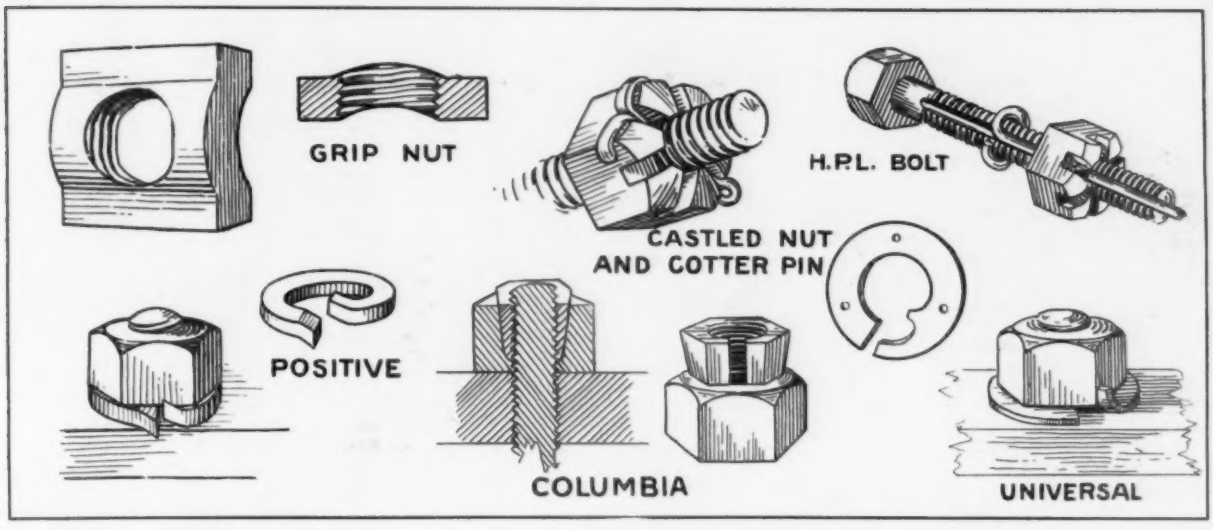
Still another principle is used in the Absolute, produced by the American Lock Nut Company, of Chicago, Ill. The principle is that of a rolling wedge. The device is a recess cut in the inner surface of the nut in which there travels a locking pin of such size when the nut is screwed onto the bolt, the angled sides of the locking pin heads fit into the threads of the bolt; the flat surfaces of the locking pin travel just against the angled top of the recess of the nut, rotating in its deepest portion. The top of the recess is of such angle that the nut is automatically and continuously locked against any backward motion which merely serves to wedge the pin more tightly into position. To take the nut off, it is merely necessary to insert a small brad into the recess to prevent the pin from rolling up into the smaller part of the recess. Hence, it is comparatively easy to put the nut on or to take it off, and it can't hurt the threads.

The Grip Nut, which is made by the company of that name, of Chicago and New York, is nothing more than a supplementary nut of a peculiar form which is put on over the regular nut. Grip nuts are blanked out of a bar of steel having an arch running through its center; the nut is threaded through this arch, after which it is deflected by pressure so as to produce, when put in place, a locking friction upon the threads. They don't require to be jammed or sprung. Just as soon as all the threads of the Grip Nut have "caught" she's locked and nothing will get it off but a wrench.

There's another device of a somewhat similar character which is styled "Hugtite," and comes from the plant of the United Nut Lock Company, of Springfield, Mass. It looks something like a miniature, very thin nut, but it's not one. Instead of threads, there are two tongues extending from either side toward the center, engaging the bolt threads on either side. These tongues are so made that when the Hugtite is in place, its faces are not parallel to the face of the nut: one edge touches the nut, but the other does not. Hence, as of two nuts on a bolt, the heavier will tend to travel the faster under vibration, the big nut would tend to ride up against the Hugtite, and the harder it presses against the lock, the greater the friction produced between the little tongues and the bolt threads. Consequently, the Hugtite acts as an effective lock.

The American Nut & Bolt Fastener Company, of Pittsburgh, Pa., has long been producing the Bartley lock for use on railroads, though just recently it has re-





designed the lock to conform to S. A. E. standards. In its simplest aspect, the lock is nothing more than a little plate which slips on like an ordinary washer. When the nut has been drawn up tight, there is a little tab which is turned up to prevent the nut from turning. To take it off again one has only to bend the tab down with a hammer.

The Universal Lock Washer Company, of New York City, produces a lock washer that looks a good deal like a spring washer, although it is not one. The washer has a little tab that the nut rides over as it is screwed into place, and when the nut is tight, the tab sticks up and prevents the nut from turning back. When the nut is once set, the washer lies flat and no part of it is under tension. It's made of hardened steel and little projections on its under side prevent it from turning. Two styles are made, one for wood working, in which there are sharp projections to bite into the wood, and one for metal working.

Still another type of locking device that possesses the virtue of simplicity is produced by the Reliance Manufacturing Company of Massillon, Ohio, which also produces all sorts of spring washers. This one is nothing more than a plain washer with a couple of little tabs which are turned down after the nut has been set up.

Besides the castellated nut and cotter pin, there is the H. P. L. Bolt, recently introduced by Harvey J. Hipple, of Lancaster, Pa. By this method, the bolt is slotted, and in the slot is placed a piece of strong and ductile wire, whose lower end is formed into a washer to fit between the nut and the surface, through which the bolt is passed. When the nut is drawn up tight, the end of the "leg," which lies in the bolt slot, is bent into the castellations of the nut, which is thus secured to the bolt.

MOVING PICTURES AS AN AID TO THE SALES DEPARTMENT

AN INNOVATION in sales methods has been established by the Foss-Hughes Company, Pierce-Arrow distributors in Philadelphia. This consists in the use of the Edison Kinetoscope for projecting moving-pictures of trucks in operation upon an aluminum screen for the benefit of the prospective purchaser or the truck driver.

In the salesroom a portion has been set aside and curtained off with black draperies for the small moving picture show. Every prospective purchaser who perhaps is interested in the delivery of coal, is shown a series of moving pictures of a large fleet of coal trucks in operation in the West. The picture gives a comprehensive idea of the entire day's work from the time the machines leave the garage in the morning until they return at night, detailed views of quick loading methods by overhead pockets, chutes, etc., and unloading by power operated dumping bodies are graphically shown upon the screen.

An element of a lighter vein is introduced to relieve the seriousness of the situation perhaps by reversing the film, at which the coal performs the unusual feat of projecting itself upward out of the coal hole into the rear end of the truck, sliding uphill to the front and piling itself up until the wagon is full, at which time the body resumes its normal position. This never fails to put the prospect in good humor. With some of the drivers the miracle remains unexplained until some wag remarks in answer to their astonished inquiry, "oh, yes, that is our patent suction lift. Great isn't it?"

If the prospect is interested in the handling of bricks, lime, cement or building materials, sand gravel, asphalt, etc., complete installations of trucks in this line of

The Edison Kinetoscope

work are shown on the moving picture film, giving a comprehensive and clear idea of what the vehicles are doing in actual service in his line of endeavor.

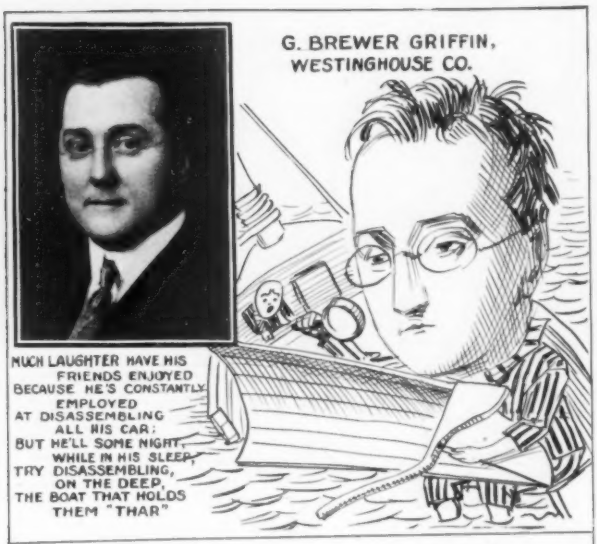
The method is as yet comparatively new and just how it will effect customers as regards fewer demonstrations being required is not yet known. One salesman in Buffalo has arranged to pack the complete outfit so he can carry it, and when advisable it is set up in the establishment of the customer himself, and the heads of the firm are invited to see what trucks are doing for other people in the same line of trade. This is a comparatively simple matter, as the outfit is not heavy and light is supplied by screwing a connection into the ordinary lamp socket. Several of the Pierce-Arrow branches are making use of this application of moving pictures.

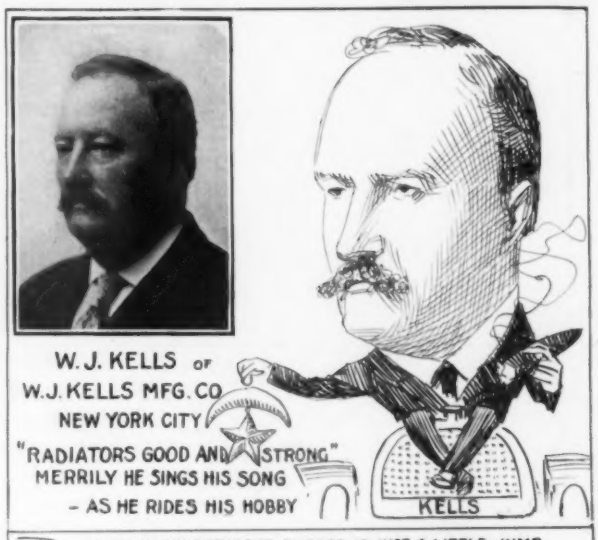
About the middle of April a new concern, known as the Merchants' Auto Delivery Company, will start a new line of business in Galesburg, Ill. This company will take over the delivery of the various stores of the city and will make a specialty of delivering goods of all sorts. It proposes to put eight trucks on the road, five of which will be devoted exclusively to the delivery of goods throughout the city. The city will be divided into five districts or routes and the same driver and helper will go over his route four times each day. For stores that do not require regular deliveries the company will have one car that will be on call for all such orders and also for general parcel delivery.

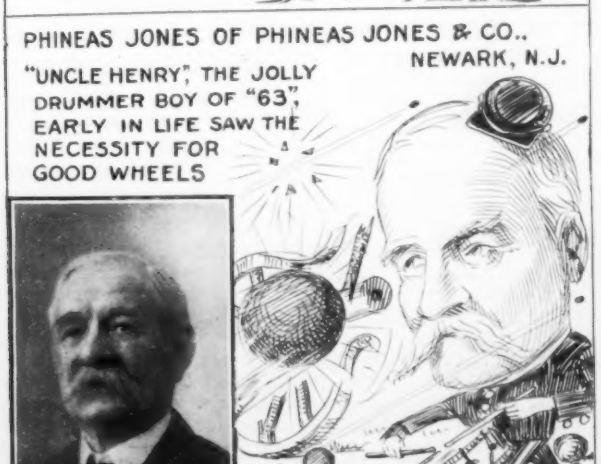
Armour & Company, meat packers, have bought a Troy trailer which has been sent to their fertilizer works in Jacksonville, Fla., for testing.

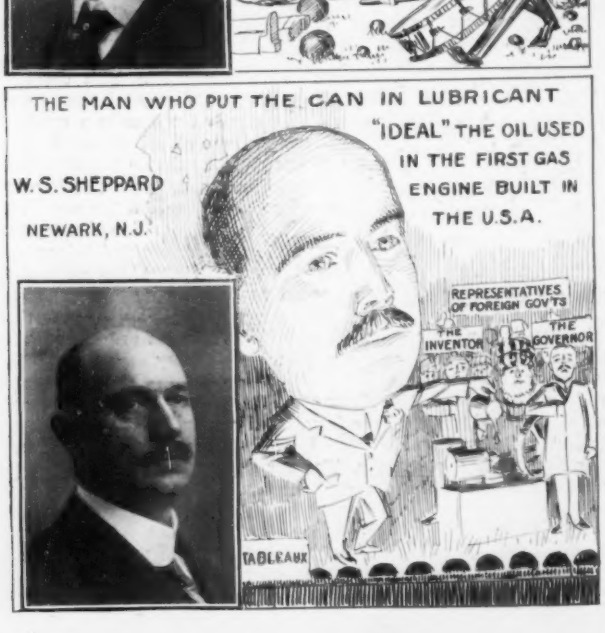
Joseph Horne Company opened a permanent home for the motor wagon department at South and Galveston Avenues, North Side, Pittsburgh, Pa., recently.

C C J GALLERY of SALES MANAGERS









The Worst Storm of a Decade Demonstrates the Efficiency of Commercial Cars

An Open Letter. What Successful Users Say. Why Some Were Not Successful

By E. S. FOLJAMBE

DURING its brief stay the blizzard which recently swept the East caused much labor and inconvenience in all the cities which were enveloped by it. Traffic was almost at a standstill in the downtown sections of both New York and Philadelphia; a few firms were able to deliver a large percentage of the goods which ordinarily would have been carried, while others were completely tied up and unable to move a wheel.

The storm in New York City was the most severe in a decade. This bears more significance than some might at first suppose, because it means that almost since the inception of the truck there has not been such a severe snowfall, in other words conditions were worse than they have ever been since trucks have been operating in New York, and both owners and drivers were confronted with new conditions.

A review of the situation shows that the city was unable to relieve the traffic tie-up as it should. Trucks were pressed into service to carry off the snow. The plows and sweepers of the street car lines assisted materially in opening a lane through the walls of snow. This being the only open road available, it was used by all classes of vehicles, and tie-ups and delays occasioned by horses, which could not keep their feet, were frequent. Their slow progress through the heavy going also necessitated frequent turnouts and passings by trucks and cars of higher speed.

Horse vs. Truck Efficiency Shown

It was noticeable that the loads of the horse trucks were about 40 to 50 per cent. of what they usually carried, while at the same time the number of horses per wagon was doubled. When this fact is taken in conjunction with the very slow movement of the horse vehicles, after efficiency as a delivery means sank in many cases below 20 per cent. In contrast with this the motor trucks were found by the experience of many large users, such as the express companies, department stores, coal companies, grocers, etc., to operate much better with full loads, owing to the fact that this gave the rear wheels the desired traction. Lack of traction was the only difficulty that seriously handicapped the commercial cars, practically all of them having ample power. Delays, due to inexperienced drivers, however, many of whom sat helplessly on the seat and spun the rear wheels, burying them deeper and deeper, until help was required to get the vehicle out, cut down the efficiency of the trucks. Inexperience, that is the only answer for such imbecilic performances. Owing, however, to the full loads which it was possible to carry, some of the users who know how, maintained their regular deliveries over the regular routes, and claimed an efficiency for the trucks of from 60 to 70 per cent. as against 20 per cent. for the horses.

A Question

We publish herewith a letter from one of the largest brewers of New York, which speaks for itself. At the same time it propounds a question, which perhaps in the answering may assist the average truck user.

New York, Mar. 3, 1914.

Commercial Car Journal.

Gentlemen:—To satisfy our curiosity will you kindly tell us why so many public and private corporations fail in their deliveries during such inclement weather as we have just experienced.

On the worst days (for vehicular travel) of the season—Feb. 14, Feb. 16 and Mar. 2, we served all our customers as always, and we did it with motor trucks exclusively. Even the carting and dumping of ashes, spent hops, etc.—yes, and snow, too—being done with a motor truck.

Yours very truly,

PETER DOELGER,
C. M. GEIGER.

Peter Doelger Company operates forty electrics and fifteen gasoline trucks. It was found on the electrics that the current consumption was very much higher, but by shortening routes all the customers were served. Some of the trucks did not get in until late, instead of 4.30 to 5.30 as usual, but the delivery of the company was maintained, and by trucks alone. According to their own statement they do not believe they could have done this with horses. Their question cannot be answered briefly. There are many reasons which account for the failure of some truck users to make deliveries. One needs only to stand on a street corner during such weather and watch the absolutely idiotic performances of some drivers to get one answer to the question. The inexperience and ignorance of conditions on the part of the owner is also partly accountable for the trouble that some users experience. By this we do not mean that others have no trouble at all, because no company can operate trucks, or horses, or any other kind of vehicle in such weather without trouble, but certain users deliver successfully, and carry on their business, while others are completely incapacitated.

Lack of Experience

In cities like Philadelphia, Baltimore, and others which are not often frequented by such severe snowstorm, and let us say where storms of this nature do not occur more than once in three or four years, a large part of the drivers find themselves contending with conditions which are entirely new to them as far as operating a truck is concerned. No such storm ever occurred while they have been truck drivers. These men invariably overestimate the ability of the truck, basing this knowledge on what they are accustomed to seeing the

One of the City's Auto Trucks at the Dump

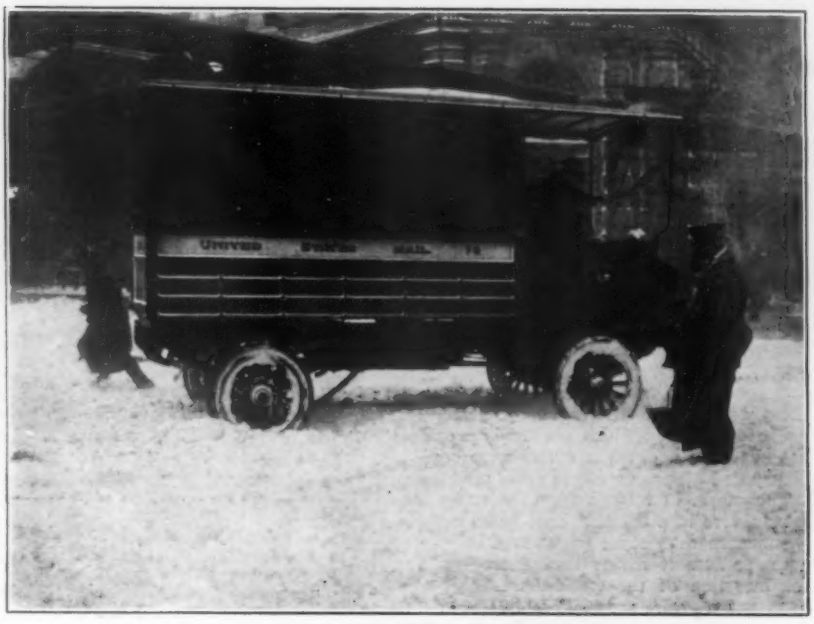
The snow, as fast as cleaned up, was dumped into the river, the new auto trucks carrying many times the size load of the little dump wagons, each of which had to have four horses

vehicle do. They get into positions from which it takes them hours to extricate themselves, positions they might just as well with a little forethought have avoided, and been enabled to deliver the goods. They get into ditches, excavations in building operations, attempt to cross the sunken end of bridges, or plow through snow drifts banked up by snow sweepers, etc., always with the same result, the truck is stalled, and if not provided with a winter equipment it cannot get out. The same thing is true of horse drivers, except that they have had more snow experience, one man is helplessly stuck in fifteen minutes while another keeps his horses on their feet and delivers the goods under almost impossible conditions.

Fortunately, this driver condition is one which improves very year, and the longer trucks are in use, the better the drivers will be.

Eleven Hundred Vehicles in Service, Yet no Emergency Calls

In illustration of this fact, take the record of the service department of the Autocar Company, of Philadelphia. Two or three years ago it was necessary to establish emergency stations north, east, south and west, which in Philadelphia means Germantown, over in Jersey, one in the southern part of the city, and another on the so-called Main Line of the Pennsylvania Railroad, where there are a chain of suburban residential sections. In addition, this company also had a central station. Each station was equipped with its emergency wagon, fitted with block and chains, repair parts, shovels, rope, etc. Two men were provided for each car. But two years ago these stations and crews were all necessary. The numerous emergency calls were phoned to the main service station, from which the auxiliary emergency stations were communicated with, and sent to the rescue of the vehicles in trouble.



One of the New York Mail Trucks During the Height of the Storm
This truck did splendid work during the storm making trips impossible with the horse equipment

Contrast this with conditions this year. On March 1st and 2d, the days of the blizzard, no auxiliary emergency stations were established whatever, although the Autocar Company has today in the neighborhood of 1100 vehicles in use in Philadelphia. Not a single distress call, requiring the services of the emergency wagon was received up to four o'clock on the afternoon of the 2d, the day of this writing. Several calls were had for anti-skid chains, but these were sent out by boys.

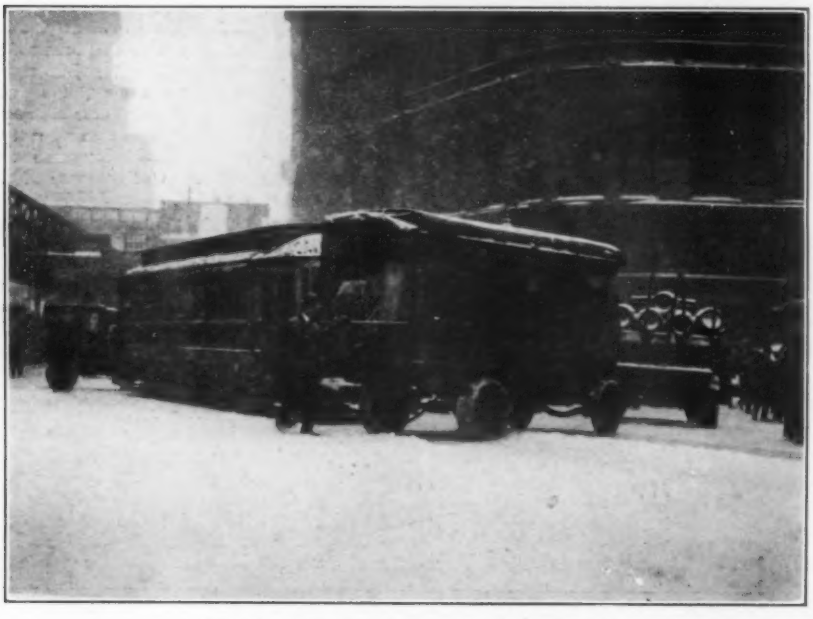
So we say that as the time goes on and drivers become familiar with such conditions, there will be less and less difficulty experienced.

Lack of Foresight

In northern cities where deep snow is common during the winter months, some form of anti-skid device is regularly employed by those who own commercial cars. One manufacturer even went so far as to fit his tractor trailer with runners, as shown in an accompanying cut. In cities somewhat further south many users, never having had the experience, provided nothing whatever for the trucks, not even a piece of rope which might be wound around the tires as an emergency anti-skid. Small wonder indeed that these vehicles are tied up at the first heavy snowfall. The writer has seen express trucks of firms which have used enough trucks to know better, helplessly sliding their wheels in light snow or slush for the lack of any kind of an anti-skid device.

The Anti-Skid Situation

The realization is forced upon one that the anti-skid situation is extremely satisfactory; devices which are effective in snow are destructive to both the tires and the entire vehicle when driven on an ordinary road surface or pavement. The successive hammer blows produced are terrific, and the jar causes premature breakage of the mechanism of the vehicle. Other devices tear the tires, and in two days' running will ruin an expensive set of dual tires, while others bend and then break and become ineffective in the same length of time. Ropes are cut through and worn out in a very few hours, chains become stretched and by this elongation are enabled to slap and beat the driving chains, the mudguards or other parts of the vehicle, even knocking off oil cups and doing other damage if not renewed at the end of 175 to 200 miles. The ordinary chain goes to pieces in an incredibly short



One Truck Doing Business in the Blizzard
This shows Broadway and Thiry-second Street during the storm. It was very noticeable that the express and brewers' trucks were continually in service

Delays, Nothing But Delays
This small dump cart is supposed to be assisting in cleaning the streets, not blocking them

time, specially built hand-forged chains being essential to anything like satisfactory service.

In this connection, the Bell Telephone Company of Philadelphia had their trucks in service throughout the storm, and used ½ in. wire rope, wrapped around the tires for an anti-skid device. This rope, when not under end tension, flattens out, and does not damage the tire, although it does not creep around the tire.

Tying up the delivery service with certain classes of trade is very disastrous, and the cost to the company, if it could be measured in dollars and cents, would be vastly in excess of the most expensive anti-skid equipment that the market now affords.

Special Routing

When a heavy snowfall like that of the 1st of March occurs it is sometimes necessary to rearrange or adapt the delivery methods to the temporary weather conditions. Instead of carrying small quantities of goods to a large number of stores on a single trip, and making that trip several times, it may be advisable to carry a larger quantity to a few stores by one vehicle, and a smaller amount to another set of stores by another vehicle, but these again are matters which must be adjusted according to the knowledge and experience of the shipping clerk or the man in charge of the delivery service.

Excessive trouble with commercial cars under such conditions is usually a positive proof of inability and lack of knowledge on the part of the users. The case of the brewing firm in question which delivered its goods with trucks exclusively, while many others were unable to make deliveries is but one proof of our contention.

Experiences of Users

The brewers were notably successful, and this may be accounted for by their longer experience with the use of trucks than most other lines. The coal companies in both New York and Philadelphia suffered more severely than most any other users, as the demand increased in exact proportion to the severity of the storm. Four and even six horses were required for ordinary loads, and the greatest difficulty was experienced in getting wagons into the proper positions for unloading. Valuable time was lost by men laboriously carrying coal, which might have been emptied in two to five minutes' time by a dumping body truck in the proper position. Those having such an up-to-date equipment were enabled to haul much more, noticeably Burns Brothers, of New York. The large fleet of approximately forty trucks was on the road both days. Many of these trucks are of 10 tons' capacity, and although full loads were carried lack of traction was the chief difficulty. Block tires, which constitute the equipment on most of these trucks on the rear wheels, do not lend themselves readily to wrapping with chains or ropes.

Lack of Power Dumping Body Expensive

An incident in Philadelphia shows conclusively the fallacy of using a modern truck in this class of service without a proper dumping body. A coal truck, which under ordinary conditions would probably cost the owner to operate at least $12 a day aside from the driver and helper, arrived at its destination after making good progress through the snow, and was just three-quarters of an hour in delivering its load, owing to the lack of a power operated body, and the poor design of the dumping body which it did have. This was on rollers, but with no rack or crank and pinion to move it to the rear. The driver and two helpers exerted their entire strength and used crowbars to force the body back to the point where it automatically tipped and dumped its load by gravity. This delay represented a cost on the truck itself of approximately $1.10, between 25 and 30 cents for the driver, and 35 cents for helpers, making a total of approximately $1.72 actually wasted in the delivery of this one load. With the proper power hoist one man or at least a man and helper would have been sufficient and the truck could have unloaded inside of five minutes. This performance was about on a par with that of some of the horse drivers who attempted to back their loaded wagons into position just the same as they would have done in ordinary weather, which of course resulted in the horses falling, unharnessing, harnessing, etc. In fact, it took about as long for the horse-drawn wagon to get into

A Dead One
One of the results of the recent blizzard. Can't be fixed in the repair shop, either

A Common Sight

It is almost impossible to back even an empty wagon into the position for loading without having trouble with horses falling. It was a common sight to see the entire traffic of the street blocked by a fallen horse lying in the cleared tracks, the only available road.

position and unload is it should take a good driver with a power hoist body to make the whole trip.

The Westcott Express Company, of New York City, uses no horses. The same is true of the Adams Express Company in the West Philadelphia district. Both of these companies were satisfied with the general performance of the truck equipment.

Delivered Twelve Hundred Cases in Three Hours

Grimstone's Express, a subsidiary company of the General Express Company, Philadelphia, Pa., which is operating a fleet of commercial cars, did some very clever work during the worst of the blizzard on March 1st, when nearly all street traffic was at a standstill. Mr. H. Johnson, manager of this company, had an order from the Diamond Match Company to unload 12,000 cases of matches, weighing approximately 35 lbs. each, from cars at the Reading depot, and deliver them to the match company's warehouse on North Broad Street. This job was undertaken with two Autocars, and in spite of the weather, completed in about three hours. This was done without serious trouble or hold-up to the vehicles. It may be said in passing, that although this company also has a large number of horses, not a horse was taken from the stable on that day.

This illustrates very forcibly a point which is not often realized by horse users, that as soon as the trucks are installed the remaining horses which are still used are at once saved the long killing hauls, as the trucks do all of this work which formerly was the ruination of the horseflesh of the establishment.

Contractors and builders were very much handicapped, as they necessarily have to operate in places which at the best are difficult, and which under the conditions of March 1st and 2d were almost impossible.

Department stores were affected less than many other classes of users, Wanamaker, of Philadelphia, being so successful that they have featured in their advertising the fact that they were delivering anywhere and everywhere with motor-driven trucks. The day following the worst of the storm, the following appeared in their advertisement:

"Inside and outside service went straight on yesterday, and delays by reason of the blizzard are surprisingly small. Wherever roads are passable for any vehicle, the Wanamaker automobiles will go there with your packages."

The Philadelphia store operates 110 Autocars, four Packards, four C. T. electrics and about fifty Ford cars with delivery bodies. The New York store has over 100 trucks. Their experience was practically the same as in Philadelphia. Of course, these trucks were fitted with ropes and anti-skid chains.

Gimbel Bros., New York City, had no serious trouble with its more than one hundred commercial cars.

Parcel-Post Trucks on the Job

The parcel post service of Philadelphia illustrates the successful use of commercial cars under such conditions. This service is now maintained with sixteen Autocars, the radius of operation including such points as Frankford, Fox Chase, Roxborough, which is an extremely hilly district, and other places within 10 miles. These trucks average from 150 to 300 stops a day each, and have a daily mileage of about 64. During the storm these trucks covered their route as usual. Some were equipped with solid and others with pneumatic tires, but all had anti-skid chains. They clean up every night, and have nothing left over. During the height of the storm they were not delayed over an hour to an hour and a half on the worst route, Fox Chase, but were held up in getting home for lack of fuel and oil, as they had not provided sufficient to allow for the extra which was used owing to excessive low gear work. On the second day they carried extra fuel and oil, and most of the machines came in practically on time. Ordinarily a regular running schedule is maintained, from which the trucks do not vary as much as a passenger railroad train from its schedule. Some of these cars

One of the E X P Trucks

The express companies were on the job throughout the storm. One of their vehicles is here seen making its way through the slush in the congested district near the wharves. Notice the truck at the right, one of the two extra horses being down.

made as high as 400 stops on the night schedule, having started at six o'clock. They had no mechanical trouble whatever, and no emergency cars were sent out.

Experience of a Large Grocery House

The Acme Tea Company, of Philadelphia, had its entire commercial car equipment on the road all day both days of the storm. They now have the following vehicles:

Three five-ton Pierce-Arrow trucks, three five-ton Packard trucks; one six-ton Packard truck, two one and a half-ton Autocars, three three-ton Pope Hartford trucks, fourteen two-ton Packards, five three-ton Packards, two one and a half-ton Whites and one two-ton C. T. Electric.

This entire equipment, consisting of thirty-four vehicles, maintained the delivery service, relieving the horses of all difficult hauls, although not working up to full capacity. All the wagons were fitted with four horses each, and followed as far as possible the car tracks, which had been cleared by the traction company's plows. They were at a great disadvantage, however, as compared with the trucks, owing to their lack of speed, which meant that they continually pulled in and out to permit cars and other vehicles to pass. This was extremely trying to the horses, but as they were only put on the very shortest hauls, the trucks taking the long trips, they were not laid up for the next day, as would have been the case before trucks were in use.

On the other hand, when a truck got in front of a street car it travelled as fast as the car, and did not have to work in and out of the cleared portion of the road. As near as the company could figure, the trucks delivered a little more than half of what would ordinarily have constituted a good first day of the week's work. The horse wagons, carrying something less than half, had double the number of horses, so that the horse equipment did somewhat less than one-quarter of its usual amount of work. The statement was also made that since the trucks have been in use, which has been about three and a half years, the equipment having been added to from time to time, it has been found that the horses are in very much better condition and much more able to cope with an emergency of this kind.

One of the Large New Trucks in Street-Cleaning Service

Before using commercial cars it was quite common for this firm to send the horses on a trip of twenty miles, which meant of course a forty-mile run before reaching home. Although extra horses were used, they were completely out of the running for the next day, which was required to put them in shape again. About four and a half horses were the average to a wagon, counting the extras which were necessary. Since the introduction of trucks the horses are almost never required to go above Thirty-second Street, in other words they do not cover over sixteen miles a day as against the former twenty-five and occasionally forty-mile trips.

One might expect under the circumstances that the horses would be sold, but it has been found that the increase of business has been such that as the trucks made possible a fewer number of horses to each wagon, they have been able to add wagons for short deliveries without increasing the number of horses. Now, however, the point has been reached when any additional growth will have to be taken care of by more trucks.

Part of the trucks in this company's service are kept near the bakery at Twenty-fifth and York Streets, there being no horses used at all in connection with the bread delivery. Owing to the weather conditions, the trucks which usually made three trips a day, delivered to only four bakeries, and made the entire delivery in one trip. In this way, in spite of the snow, sufficient bread was supplied the various stores to take care of their actual wants.

The Locomobile truck, equipped with all-steel power dump body and shown in the accompanying cut, is in daily service of the Pennsylvania Railroad, hauling ashes from the Power House at Sixteenth and Filbert Streets, Philadelphia, to different points of discharge.

Through the entire storm period this truck broke its own way through the snow drifts with full six-ton loads and never missed a trip.

At other times, when the streets became glazed with ice, an arrangement was made to sprinkle the ashes along the streets

This Six-Ton Truck Never Missed a Load

A steel dumping-body six-ton Locomobile truck in the service of the Pennsylvania Railroad, with a full load, just after leaving the power house

with this truck, thereby materially adding to the safety of the pedestrians, and also making it possible for horses to keep on their feet and haul their loads.

The truck is shown just after leaving the Power House with a six-ton load of ashes. Throughout these snowstorms, instead of the loads being smaller, they were increased. This makes the performance of the truck even more creditable.

pulled the loaded wagon, horses and the crowd of bystanders up the hill.

Full loads on trucks for traction and partial loads on horse wagons is one of the reasons for the difference in the winter efficiency of the two methods of transportation. This Krebs truck was fitted with anti-skid chains and was only stuck once, which was really the fault of the driver for attempting to plow through a snow-

Transforming the Motor Truck Into a Sleigh

Springfield, Mass., was hard hit in the recent severe snow storms, having a total fall of nearly thirty inches. The Knox Automobile Company, however, overcame the difficulty in an ingenious way, on its tractor trailer combination, by putting runners under the trailer wheels, and also under the front steering wheel of the tractor.

The ability of trucks to carry their full load during snowy weather was aptly illustrated by an occurrence which happened in Philadelphia. The Pyle Storage Company, of 5125 Market Street, has been a consistent user of a Krebs truck, which was continually on the road during both days of the storm hauling household furniture, as it will be remembered this was the first of the month, and moving time for many people.

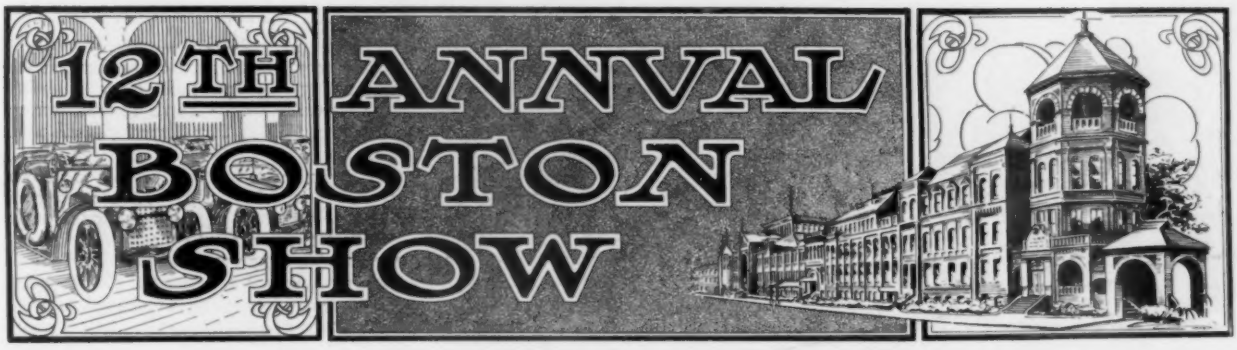
Returning from a trip, the truck attempted to assist a stalled coal wagon, the horses of which were vainly attempting to pull the loaded wagon up an incline. The truck was hitched to the pole, but it was found when the power was applied that in spite of its chains the wheels spun, the truck being empty. The usual crowd of bystanders gathered, there being some twenty-five men, whereat Mr. Pyle called upon the crowd to jump into the truck, so all the men climbed in. Again the power was applied and without any trouble at all the truck wheels gripped the ground and drift which might have been avoided. Shovels were resorted to, and in a few minutes the truck was on its way again. Many of the hauls which they made during the two days were for people who had tried four or five different moving companies in vain, these companies not having trucks were not putting their horses out at all.

The statement was also made that the work which the truck performed during the storm would have been absolutely out of the question with horses, and that at this same time last year the horses were standing idle eating their heads off a considerable part of the time, while since the truck has been installed there has been business all the time, and new business coming in which they never before were able to take on. Mr. Pyle said: "We wouldn't go back to horses if we couldn't have power driven vehicles, if somebody would present us with a full horse equipment."

In summing it up it may be said that the performances of commercial cars during this storm was nothing less than phenomenal. When it is considered that here we have a vehicle running on a road which is bad enough at the best, and operated by a man who is not as a rule capable of handling emergencies, and who all too often is indifferent, it is surprising that under these conditions trucks accomplished what they did during such a blizzard that a well-organized system like the Pennsylvania Railroad, with trains running on steel rails and fitted with every known appliance in the way of rotary and other plows, has to abandon thirty trains and leave them for twenty-four hours at a time stalled on the line. When these things are considered, the performance of the trucks is really remarkable.

TRUCKS BEAT RAILROADS HAULING OYSTERS

Peerless trucks, operating with greater promptness, have replaced express shipments of oysters from the beds at Warren, R. I., to commission houses in Boston, Mass. To get the Warren river oysters into Boston and have them fresh, it formerly was the practice to have them packed ready for shipment every afternoon, so that they could be in the city next morning ready for distribution. Formerly the tubs were made ready at Warren at 4 o'clock in the afternoon, loaded on wagons, unloaded into express cars, unloaded from one train and loaded into another at Providence, loaded onto horse trucks at the Boston station and unloaded at the commission houses, and delivered by wagons to customers. The real difficulty was that the commission merchants, in order to serve their trade, had to have their stock by 7 o'clock in the morning, and the express companies could not make deliveries until 8, 9 and 10 o'clock, and the shippers and receivers were both discouraged. Two Peerless trucks were used, the same rates being charged as by the express companies, the growers were given two extra hours a day to prepare their shipments, and it was not necessary for the trucks to leave Warren until 6 o'clock in the evening or even later. After loading, the trucks were driven to Providence, where they stayed until midnight, when they started for Boston. Five hours was easy time for the trip, and the oysters were always on hand when the commission merchants opened their places of business.



THE Boston Automobile Show has gradually gained in prominence until it is on a par with the sanctioned shows of New York and Chicago—in fact, it often exceeds these shows in magnitude. The enormous Mechanics Building is again the scene of activity. During the last week the pleasure car show held the boards, and on the 17th the doors will be thrown open with the trucks in place using the same stage settings. An idea of the decorations may be had from the accompanying photographs and description.

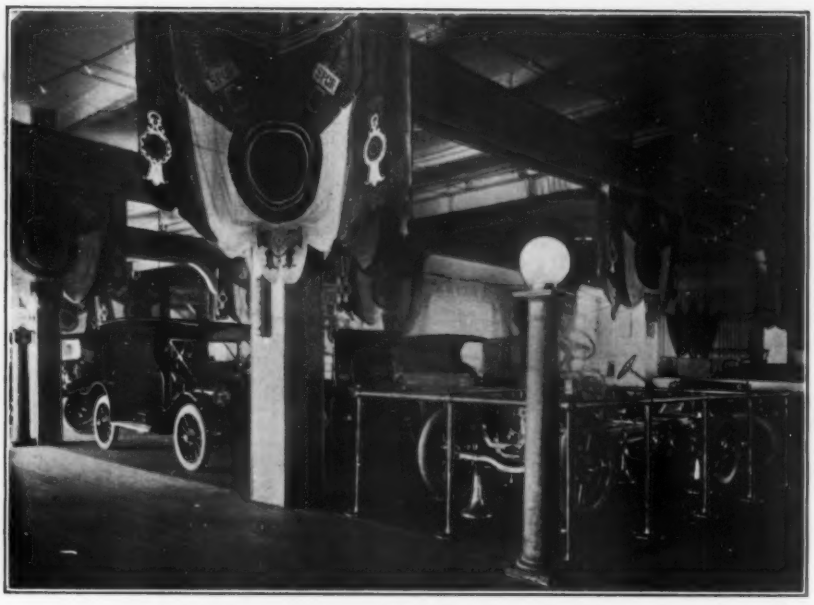
It may be of interest to note that in 1910 the Boston Show held the record for being the largest show, with 650 cars and chasses, representing 122 makes. Again this year Boston will hold the record with 138 exhibitors. In point of attendance and sales the show has always been effective, attendance having increased from 69,000 in 1908, to 245,000 at last year's show.

The illumination of the exterior of the building is this year one of the features, the entire length of the building, and it is a long one, as shown in our headpiece, will be illuminated with signs forming the lower portion, and the tower, which for the first time will be brilliant, forming the apex, Machinery Hall presents a Roman scene, with marble panels and statues against a background of dark foliage. Antique bronze columns each support an illuminating globe, bearing the name of the exhibitor. As usual there are many paintings, most of them representing scenes in Italy. The grand hall conforms to Venetian ideas. An enormous curtain 25 ft. long and 45 ft. high above the stage stands out boldly, giving a mosaic effect, with a 90 ft. long perspective view of Venice in the background. Flags, banners, and crests of the ancient Romans make the scene brilliant with color. The structural work of the building is covered by an enormous canopy representing open carved work, and the entire scene is illuminated by twelve massive wrought iron lanterns of Venetian pattern. Beneath each of these are festoons of flowers, while scenes representing the Grand Canal form a decorating border along the walls. The main mural decoration, however, is a comprehensive view of the Grand Venetian Canal 150 ft. long and 40 ft. high, the effect being heightened by the surrounding mass of foliage. The space in these halls is occupied by the old time exhibitors, most of the new firms being in the basement, which has an exhibition space practically equal in area to the main floor.

In the following preliminary sketch of the show we are describing and illustrating a few of the new cars and devices shown. A more complete and detailed review will appear in the next issue of the COMMERCIAL CAR JOURNAL.

LIST OF EXHIBITORS—BOSTON COMMERCIAL MOTOR VEHICLE SHOW

SPACE	NAME	ADDRESS
131-32-33	Abrams Company, Meyer,	159 Vassar Street, Cambridge, Mass.
113	Atterbury Motor Car Company,	Buffalo, N. Y.
561-2	American Tire Company,	11 Suffolk Street, Holyoke, Mass.
129 & 130	Alma Motor Truck Company,	Detroit, Michigan.
115-6-7	Autocar Company,	642 Beacon Street, Boston, Mass.
9	Baker Motor Sales Company,	400 Massachusetts Avenue, Cambridge, Mass.
5	Buick Motor Company,	15 Lawton Street, Boston, Mass.
449	Boyd, F. Shirley,	903 Boylston Street, Boston, Mass.
26-27-28	Chase Motor Truck Company,	Syracuse, N. Y.
30	Chicago Pneumatic Tool Company,	Chicago, Ill.
30	Eldridge, W. E.,	221 Columbus Avenue, Boston, Mass.
108-109	Federal Motor Truck Company,	Detroit, Michigan.
129-130	Fischer, Company, C. J.,	233 Massachusetts Avenue, Cambridge, Mass.
134	Forbes, Walter J.,	243 Columbus Avenue, Boston, Mass.
337 & 348	Fryer Company, Chas. H.,	Providence, R. I.
1	Fuller, Alvan T.,	1089 Commonwealth Avenue, Boston, Mass.
110-111	Garford Company, The,	Elyria, Ohio.
14 & 18	General Motors Truck Company,	753 Boylston Street, Boston, Mass.
105-6	International Harvester Company of America,	Somerville, Mass.
107	Jeffery Company, Thomas B.,	Kenosha, Wis.
518	Keating & Decker,	Newton, Mass.
139	Kinney Manufacturing Company,	100 Boylston Street, Boston, Mass.
8 & 12	Knox Automobile Company,	885 Boylston Street, Boston, Mass.
102-3	Kelly-Springfield Motor Truck Company,	Cambridge, Mass.
131-32-33	Lauth-Juergens Motor Car Company,	Fremont, Ohio.
119 & 120	Linscott Motor Company,	163 Columbus Avenue, Boston, Mass.
30	Little Giant Truck Company, of	Boston, 221 Columbus Avenue, Boston, Mass.
13 & 17	Locomobile Company of America,	700 Commonwealth Avenue, Boston, Mass.
15-16-19-20	Maguire Company, J. W.,	745 Boylston Street, Boston, Mass.
24-25	Maddocks, H. Ross,	175 Pleasant Street, Boston, Mass.
113	Mattapan Motor Car Company,	Mattapan, Mass.
517	Milliken, E. H.,	68 W. Rutland Street, Boston, Mass.
309	Myers Brothers,	1459 Madison Avenue, New York.
1	Packard Motor Car Company,	Detroit, Mich.
31	Parcel Post Equipment Company,	20 Green Street, Cambridge, Mass.
144	Palmer-Moore Company,	Syracuse, N. Y.
15-16-19-20	Pierce-Arrow Motor Car Company,	Buffalo, N. Y.
110-111	R. & L. Company,	915 Boylston Street, Boston.
107	Rockwell, Inc., C. P.,	640 Commonwealth Avenue, Boston.
119-20	Reo Motor Car Company,	Lansing, Mich.
9	Selden Motor Vehicle Company,	Rochester, N. Y.
24 & 25	Stewart Motor Corporation,	Buffalo, N. Y.
108-9	Standard Motor Truck Company,	Detroit, Mich.
517	Sewell Cushion Wheel Company,	Detroit, Mich.
418	Spedolene Lubricant Company,	14 James Street, Malden, Mass.
21-22	Stanley Motor Carriage Company,	Newton, Mass.
24-25	Twombly Car Corporation,	Avondale, N. J.
122	Universal Motor Truck Company,	Detroit, Mich.
112	Velie Motor Vehicle Company,	16 Amherst Street, Cambridge, Mass.
138	Walter Motor Truck Company,	49 W. 66th Street, New York.
3-4-6-7-10-11	White Company, The,	930 Commonwealth Avenue, Boston, Mass.
108 & 109	Whitten-Gilmore Company, The,	620 Commonwealth Avenue, Boston, Mass.
110-111	Willys-Overland Company.	Toledo, Ohio.



A Good View of the Venetian Decorations

Republic One-Ton Truck

This machine, the product of the Alma Motor Truck Company, Alma, Mich., will be exhibited at booth 36 of the Boston Commercial Car Show. It is built of standard units, and along strictly conventional lines. Only one model is produced, but in three wheelbases.

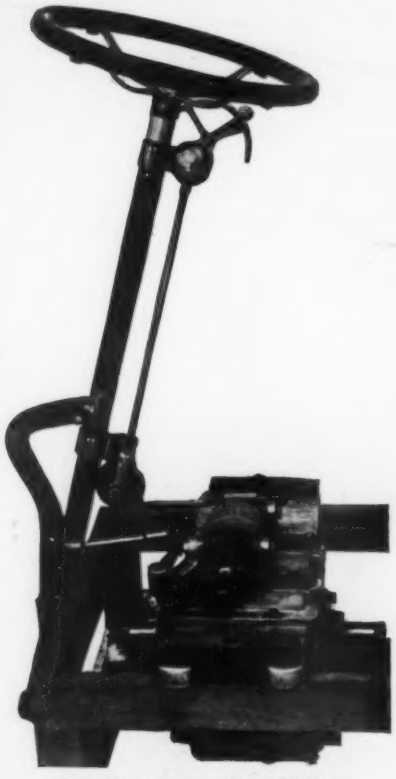
Autocar at Boston

The exhibit of this Ardmore, Pa., company will consist of chasses equipped with a grocery type; a bottler's type; an express type; a hotel 'bus type, and a confectioner's type body. The chassis will have all the latest improvements recently made by this company.

A NEW MECHANICAL GEAR SHIFTER

The very latest device on the market for eliminating the gearshift lever is being manufactured by the Lewis Manufacturing Company, 1229 N. 51st Street, Philadelphia, Pa.

The device in question is what is known as a mechanical gearshifter, there being no pneumatic, electric or spring actuated parts to force the gears into mesh. The actual movement of the gears is controlled by mechanical linkages through the clutch pedal, the same results being accomplished with the so-called pneumatic and electrical automatic gearshifters. The operator can anticipate whichever speed he desires to go into by setting the indicator just below the steering wheel, at any desired speed regardless of what speed the car may be in. Nothing whatever takes place as far as the gears are concerned until the clutch pedal is depressed. This action instantly brings to neutral any gear in mesh, and at the completion of the clutch pedal movement the gear indicated by the selector is meshed without any skill or dexterity whatever on the part of the operator. This makes it possible in approaching a hill to select beforehand a lower speed than the direct, if it is believed that it will be necessary to go into it. If found necessary, the desired gear change is effected instantly by simply depressing the clutch pedal, and letting it engage again.



Side View, Lewis Gear Shifter

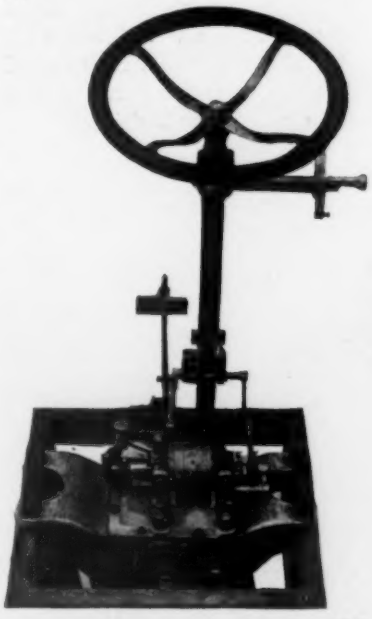
Showing the indicating lever under the wheel and the connection to the shifter from the clutch pedal.

This device is applicable to practically all types of sliding gear transmissions, is a

compact unit having comparatively little weight, and of course being attached directly to the transmission case is invisible with the floor boards in place. The only part of the mechanism that shows is the small sector beneath the steering wheel which has marked on the rim of it the various speeds, such as 1st, 2nd, 3rd, 4th, N for neutral, and R for reverse. A short lever, about 3½ in. in length with a button handle is moved opposite these figures according to the speed desired, and the pedal does the rest. To prevent putting it into the reverse accidently there is a stop, and to move the indicating lever beyond this it is necessary to pull outward slightly on the knob. This stop also represents the neutral position, making it a simple matter to move the indicating pointer back until it stops, and the operator is assured that the gears will then be in neutral position.

The Mechanism

This device consists of a series of square section rods, each fitted with small steel rollers, which engage cam-like surfaces that move short gear shifting arms, which stick directly into the change gear case, the device itself being bolted to the top or side of the transmission case, according to the construction. Each of these rods is actuated by a central rod around which they are grouped. The central rod has a hammer-like projection on the end which does the pushing and all that the placing of the indicating pointer below the wheel does, is to move the hammer-like end of the central rod, so that it will engage the proper push rod. This central rod is moved by linkage connecting it with the clutch pedal. No springs are used to force the gears into mesh, the only springs employed being used merely to return the rods to their original positions, these being of the coil type, encased and operating in lubricant, and not being subjected to any strenuous work, are practically indestructible.

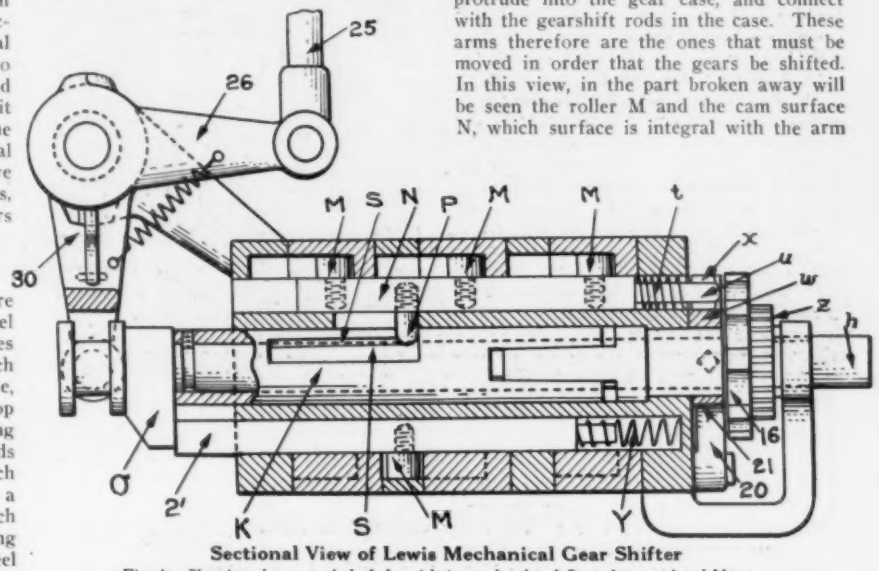


Lewis Gear Shifter
As mounted in a show stand at the Boston Exhibit

Detailed Description With Reference to Drawings

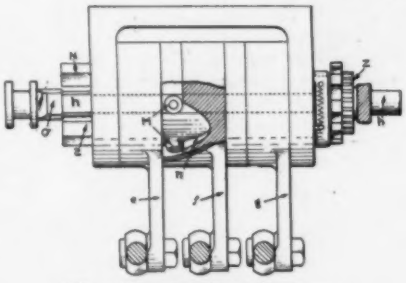
It is impossible to give a clear understanding of this device to the average reader even from an elaborate set of working drawings. For the purpose of description, therefore, the writer has chosen to reproduce parts of the patent office drawings in preference to the actual working drawings. Fig. 1 is a diagrammatic cross section of the device, which is about 10 or 12 in. in length, and about 5 in. high. Fig. 2 shows also in diagram form the cam surfaces and the arms which actually shift the gear-shifting rods in the transmission case. Fig. 3 shows a partial end view, Figs. 4 and 5, details of the mechanism.

Referring to Fig. 2, the arms e, f and g protrude into the gear case, and connect with the gearshift rods in the case. These arms therefore are the ones that must be moved in order that the gears be shifted. In this view, in the part broken away will be seen the roller M and the cam surface N, which surface is integral with the arm



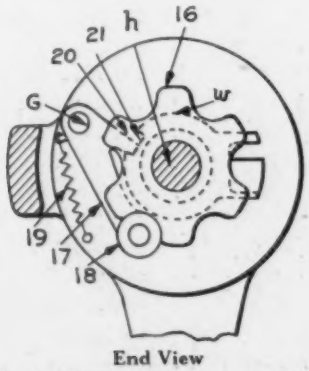
Sectional View of Lewis Mechanical Gear Shifter

Fig. 1. Showing the central shaft h, with its pusher head O, and neutral rod N, etc., as explained in the text



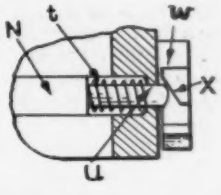
View Showing Cam Surfaces

Fig. 2. This shows levers e, f and g, which operate the gear-shifting arms. Two arms are used for a three speed and reverse transmission, and three arms for a four-speed transmission.



End View

Fig. 3. Showing positioning star wheel 16, by means of lever 17, the wheel of which rests in the hollow between the teeth and holds the pusher head O, of Fig. 1, in proper alignment opposite the rod which it is to push, as explained in the text.



Detail of Neutral-Rod End

Fig. 4. This mechanism releases rod N as soon as the gears have been placed in neutral, the springs returning the rod to its original position.

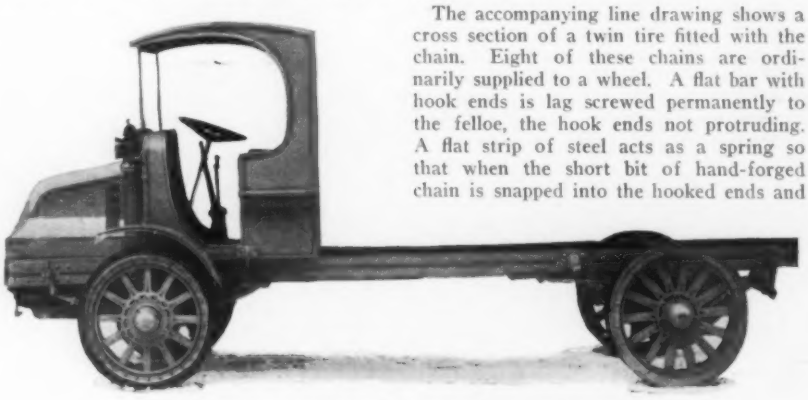
F. Arms e and g are fitted with cam-like surfaces in a similar manner. The rollers M are on the rods which were mentioned as being pushed inward, and engaging the cam surface, forcing the arms e, f and g, to move in one direction or the other as the case may be. In Figs. 1 and 2 are shown the hammer-like end of the central rod h which engages the ends of the levers 1, 2, 3, N, and R. At Z, Figs. 1 and 2, is a small pinion keyed to the shaft h. It is in mesh with a small rack directly above it, and whenever the selecting pointer is moved, the rack rotates the gear Z, thereby turning the shaft h, which moves the hammer head O into the proper position for pushing rods 1, 2, 3, 4, N or R as the case may be for these desired speeds. Pressing against this hammer head O is an actuating arm 30 connected by lever 26, and rod 25 to the clutch pedal. Naturally when the pedal is depressed this connecting mechanism pushes the hammer head O inward, and it pushes the rods which act against the cams, which move the levers e, f and g to shift the gears.

The only thing that it is necessary to explain is how the gears are by the first part of the clutch pedal motion moved to neutral position, while a continuation of the same clutch pedal motion then meshes the gears. This is accomplished in the following manner. Referring to Fig. 1, bar N shown in the upper part of this view is the one that moves the gears to neutral. Projecting from this bar is a pin P which engages a slot S in a sleeve K, which surrounds the central shaft h. As the shaft h and sleeve K are pushed forward through the action of the clutch pedal, bar N by means of the pin P is caused to move with it, and as it moves with it its roller M engages one of the cam surfaces similar to n (Fig. 2) to move one of the arms, shifting the gear into neutral position. While this action is going on, the end of the bar N, detailed in Fig. 4, marked U, engages a cam surface X attached to the sleeve K, turning this cam, and thereby rotating the sleeve K, so that small pin P comes out of its notch into the main slot S in the sleeve K. Instantly the rod N jumps back to its original position under the action of the small coiled spring T at its end. This all takes place while the rod h is making the first part of its motion. As the rod h continues to move, its hammer head O then engages whichever rod it is set for, as rod 2 in this illustration, and forces it forward until its roller M operates its cam to shift the proper arm e, f or g. The rod 2, as soon as released is then returned to its normal position by the spring Y, which was compressed by its forward motion.

The pusher head O is accurately brought opposite the rod it is to push, by means of the simple mechanism shown in Fig. 3. A star wheel 16 has resting against it a roller 18 on the end of an arm 17. Spring 19 causes the roller to remain in contact with the star wheel and drops it into the notch as between the teeth, thus lining up the shaft h and holding it in position.

Again referring to Fig. 3 we will explain how the pin P of the neutral bar N is brought back into it recess notch ready to again shift the gears to neutral when moved. In Fig. 1 the disc w attached to the sleeve K has a recess 21, which is more clearly shown in Fig 4, the end view, into which a short projection or arm 20 of the lever 17 extends. As the selection lever under the steering wheel is turned, rotating the pusher head O away from whatever position it is in, the roller 18 rides out of its recess in the star wheel 16, turning the lever 17 on its pivot G, but this motion turns the disc w and the sleeve K to which it is attached, into such a position that pin P of the neutral rod N (Fig. 1) is again brought into the recess notch r of the slot S.

As will be seen, each part is merely a lever or cam, all very compact and of substantial construction. There appears to be nothing in the construction of a delicate nature, and as there are no adjustments, there should be nothing to get out of order. Unless some of these parts are actually broken the gears cannot help but shift whenever the clutch pedal is completely depressed. Missing a gearshaft is impossible even to an inexperienced operator.



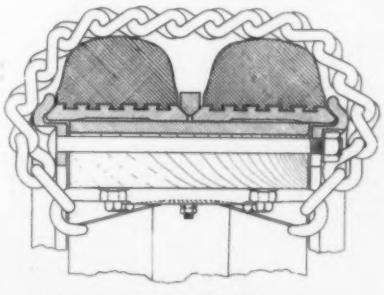
Walter Five-Ton Front Drive

This machine, which will be shown at the Boston Commercial Car Show, will, with the Walter front and four-wheel drive trucks, be fully described in our April issue

PIERCE-ARROW ANTI-SKID CHAINS

The Pierce-Arrow Company is one of the few truck manufacturers that seems to realize the importance of an anti-skid device for trucks which are being used in the snow. This company is now supplying at a reasonable price a special anti-skid device for its five-ton vehicle to Pierce-Arrow users.

The accompanying line drawing shows a cross section of a twin tire fitted with the chain. Eight of these chains are ordinarily supplied to a wheel. A flat bar with hook ends is lag screwed permanently to the felloe, the hook ends not protruding. A flat strip of steel acts as a spring so that when the short bit of hand-forged chain is snapped into the hooked ends and laid across the tire the ends of the chain cannot come out. This makes a very simple means of applying the chains, as the driver simply snaps the end link of the chain into the snap hooks, putting on one chain at a time, so that it requires but a very few moments to apply or take the device off the wheel. This is extremely important, as it enables the driver readily to apply the chains when needed and take them off when hard or dry surfaces are reached. When stretched from continued use the chains can be replaced, the strips with the hooks remaining permanently on the wheel.



Special Anti-Skid Chains for Pierce Trucks

Cross pieces with snap-hook ends are permanently attached to the felloe, and hand-forged chains can be quickly snapped across the tires and as quickly removed. There are eight to each wheel.

One of the Side Aisles at the Boston Commercial Car Show

American Express Company, Chicago, Ill., has installed two Urban two-ton electrics.

Hawkins Motor Car Company, Spokane, Wash., has the agency for the Menominee delivery truck.

Motor Trucks on Highways*

Inter-relation of Highway Builder, Highway User and Truck Builder. Co-operation Among Non-Metropolitan or Rural Truck Users Necessary. Influence of the Automobile on Road Building

THE interests and activities of highway engineers and motor truck builders and owners are intimately associated. It is most desirable that these three groups should undertake their respective tasks in a spirit of co-operation. The final object of all highway construction, repair and maintenance operations is to secure cheap and comfortable traffic conditions. This is the same object for which the designers and builders of motor trucks labor; it is the same object eagerly desired by the traveling and commercial public.

It is not sufficient for the highway engineer to construct a road of excellent appearance and service when new; it is not sufficient for a motor truck builder to construct a truck which is efficient only under selected favorable conditions; nor is it sufficient for the public to simply demand better trucks and better roads. The highway engineer is now called upon to construct roads which will continue to meet more exacting conditions of travel than formerly. The motor truck designer must supply a motor truck that will not unduly injure the roads and the public which uses the roads and insists on their upkeep must be prepared to use the roads carefully and to meet the expense of superior construction and more careful repair and maintenance.

In discussing the interrelation of these three groups of men, it is well to understand existing conditions; with respect to roads, it is only necessary to go back to the beginning of the State aid movement 20 years ago to find the beginning of systematic highway improvement in this country. There has been spent in round figures $160,000,000 in State aid for highways since that time, and with this money there has resulted about 25,000 miles of first class country roads. On account of the motor vehicle, about the year 1906, it became necessary to adopt on the country highway, built by the States, radically modified methods of construction and maintenance. It has taken but a few years for our highway engineers to convert the largest percentage of waterbound macadam roads into bituminous surfaced roads. This change in construction and maintenance is continued because of the increase of motors and operates for their benefit.

It cannot be denied that highway engineers were surprised at the behavior of the ordinary macadam road when automobile traffic became general. They at first expected that the rubber tired vehicles would prove a benefit to the macadam surface. It required more than half a century to familiarize the public and highway engineers with the advantages and proper method of building waterbound macadam roads. It is not surprising to find that the construction and maintenance of bituminous macadam roads for 8 years still leaves some questions unsolved. It is perfectly natural also to see entirely new forms of road construction, such as brick and concrete, appear.

With reference to the construction and operation of motor trucks there are many interesting questions. The motor truck made its appearance in the city and it began its work on city pavements, but it has steadily extended its radius of travel and usefulness into the surrounding country. The relatively superior pavement of city streets, where wealth is concentrated and population is dense, can obviously not be found in rural districts. It is going to be a most interesting economic problem to determine to what extent road improvement in country districts is justified. It cannot be denied that the extensive use of motor trucks beyond the present suburban zone is largely governed by road conditions and it is most natural that motor truck builders and users should urge further road improvement.

The total expenditure from all sources on our country highways was estimated by the Office of Public Roads in 1904 at about $80,000,000, and for 1912, approximately double that sum—$160,000,000. If the increase has been uniform during the interval, the total expenditure has exceeded one billion dollars. A large part of this money has been spent unwisely without a doubt; nevertheless it is a hopeful sign to find that highway expenditures have increased per mile of road by nearly one hundred per cent. in ten years. In the 3 years only from 1911 to 1913, inclusive, over $112,000,000 in highway bonds were voted by counties, districts and townships alone, and the total amount of all bonds voted previous to 1914, including State highway bonds, is now about $446,000,000.

No one questions that the automobilist has exerted a powerful influence for the general improvement in highway conditions. He has shown great capacity for organization and for educating the public mind. He has contributed liberally to the upkeep of the roads he uses. In 1912, the total automobile license fees were nearly $5,000,000, and in Massachusetts they were nearly sufficient to meet the entire cost of repair and maintenance of State highways. Returns for 1913 indicate that the fees will aggregate about 30 per cent. greater than during the year 1912. The cost of repair and maintenance of the highways used by the motorists has been increased, but it is extremely doubtful, in view of the enormous increase in the volume of traffic, whether the cost per unit of travel has been much increased.

It is not entirely due to the peculiar action of motor vehicles that our roads have worn out faster than formerly; it is largely due to the increased use to which the roads have been put. Legislation affecting the construction and operation of motor vehicles and motor trucks has appeared with increasing frequency. It is very desirable that such legislation shall be based upon complete and detailed information. There is every reason to believe that the three road congresses that have been held in Europe have devoted careful attention to this subject, and yet the reports and resolutions of these congresses show that, with all the information gathered by the representatives of the various countries present, no final conclusions were possible. The very last word on the subject from the London congress is that there is still a lack of precise information in regard to various causes of wear and deterioration of roadways and more information is needed which shall be compiled on scientific and standard lines. The gist of the matter is that, in the opinion of the members of the congress, there should be a restriction of weight on the heavy loaded axle; a restriction on the weight per inch of width of wheel tire and a restriction on the average speed of operation. These restrictions do not seem unreasonable in form. It is not expected that any limit to weight, tire load and speed will be received without some opposition on the part of motor builders and motor users.

It is interesting to note, however, that recent legislation in Massachusetts and recent regulations of the Highway Department in New York State follow very closely the figures which have developed in the three road congresses. For example, the weight per inch of tire suggested in the road congress was about 840 lbs., and the New York and Massachusetts restrictions make it 800 lbs. The weight on the heavy axle suggested at Paris and Brussels was 8800 lbs. for a speed of 10 to 16 m.p.h.; the weight restriction in New York and Massachusetts is a total weight of 8000 lbs. for a speed of 15 m.p.h. In both the States of Massachusetts and New York special permission is allowed for exceeding the restrictions laid down.

The general opinion that heavy motor vehicles can and do damage to the roads seems justified. It is interesting to notice, however, that increasing attention is given to the analysis of the particular cause of damage and future study should be of great benefit both to the highways and to the motor truck builders and users. Excessive tire loads and the use of studs, flanges, ribs and other projections are universally condemned by the highway engineer.

Much has been written concerning the economy of the motor truck. When, however, statements are made concerning the ultimate expansion of the use of the motor trucks to farms and to country districts, they should be made with due regard to facts. If it is true that continuous employment of the motor truck driven by trained drivers and examined by skilled mechanics are necessary conditions, it is difficult to see how these conditions can be met on the farm. The cost of hauling farm produce to market is undoubtedly excessive; it ranges from 20 to 35 cents per ton mile.

Recent figures have been presented by a highway contractor showing cost on highway work with a motor truck of 16 cents per ton mile. It is doubtless true that motor trucking can and is done for considerable less per ton mile for less exacting work. However, farmers can haul on improved highways with horses at from 12 to 15 cents per ton mile and his crop is marketed but once a year. He is notoriously careless of machinery and extremely unwilling to face charges for deterioration, interest and insurance. If the motor truck builders can induce the farmers to use motor trucks on a co-operative basis so that the machine need not stand idle, it would be a great benefit to their business. If farmers could be made to co-operate in the purchase of motor trucks, they could perhaps develop co-operation along other lines that would be extremely beneficial.

*Extracts from paper by Dr. L. I. Hewes, of the United States Office of Public Roads, presented before the Motor Truck Club of America, February 18, 1914.

and in this way the motor truck would prove of great indirect benefit to the farming industry. It is estimated, for example, that over 1000 farmers send milk daily to the city of Washington; here is a big opportunity for the use of the motor truck. The milk must move away from the farm each day and in many cases the milk produced at the individual farm is only a portion of a load for a double team.

There ought to be a great usefulness for the motor truck in connection with the school consolidation in rural districts. At present, there are many consolidated schools where scholars are carried in horse-drawn vehicles from a limited area. With the use of motor vans, these areas could be greatly enlarged, and particularly high school attendance in larger towns could be made possible for those living in the country at distances two and three times as far as is now the case.

The law of increasing benefits from new combinations is bound to operate in the case of the motor truck. There will arise surprising results from its adoption. The millions of horses and other animals which are now maintained for city service will eventually disappear. These horses at present consume a vast bulk of grain and hay grown on the farms. With the releasing of land from the support of animals, should come a strong influence to reduce the cost of grain, fruit and vegetables to the consuming public.

Those who advocate the use of the motor truck will doubtless find it better in the long run to avoid overstatement. It is a little early to tell the farmer that we have outgrown our present system of hauling; it is risky to say that 20 tons on each axle would do no harm to even a concrete road. It is ridiculous to say that our highways haul 6,000,000,000 tons annually and immediately imply that this 6,000,000,000 tons should be hauled by motor trucks. The railways carried in 1910 not quite 1,000,000,000 tons which originated on their lines, and the figures were not much changed for 1911. It is unsafe to even assume that this entire tonnage moved over the highways, for it includes the item each year of bituminous and anthracite coal of nearly one-third the total.

In arguing for improved highways, we often see the statement of the very low cost of hauling on the continent of Europe. It is very doubtful if any better roads are built in Europe and England at present than the best types of roads constructed in this country. The reason for the excellence of the European roads is because of their continuous maintenance, but the same degree of maintenance in this country will cost many times as much as it does in Europe. We cannot hire road patrolmen for the price paid the cantonnier on the National French roads. These men receive an average salary of about $175 per year for taking care of about 3 miles of highways; furthermore, the costs of hauling on European roads, that are always compared with our costs to a disadvantage, are not as low as they are made to appear. Just as the labor or maintenance is cheaper so is all labor cheaper in Europe, and there must be supplied a factor of at least 1¼ in most cases to bring the cost of ton miles hauled in Europe to a parity of the cost in this country. The ten cents per ton mile in Europe at least represents fourteen cents in this country, and hauling on graveled roads was done as low as 13 cents per ton mile in Virginia last year.

It ought to be possible to develop a type of motor truck for farm service on which the annual deterioration could be reduced, and which could operate for a number of years to come on relatively poor roads. Efforts in this direction ought to be more productive than efforts to sell the farmer a machine which his situation does not at present justify.

It is quite probable that for a long time to come the greatest usefulness of the motor truck will be found in the metropolitan districts of greatly increased radius. In such regions, it is highly desirable that the highway engineer and the motor truck designer should get together and study their common difficulties. If we can get an insight from the railroads, there is much evidence to expect that our highways will develop in mileage and durability to meet the increased demand for motor truck transportation rather than to expect that legislation will tend to eliminate the development of the usefulness of the motor truck.

WORM-GEAR EFFICIENCIES AND EFFECT OF TOOTH PRESSURE ON EFFICIENCY

The National Physical Laboratory has carried out some very valuable tests on the efficiency of worm gearing* made by the Daimler Company. The worm in question was what is known as the "hollow" type, to distinguish it from the "parallel" worm. Illustrations of the two types are seen in cut. The testing machine used by the National Physical Laboratory was built by the Daimler Company to the designs of Mr. F. W. Lanchester, and it has also been used at the Daimler works to test the efficiency of the "parallel" type of worm in comparison with the "hollow" type. The following table gives the results.

	Efficiencies of Worms (per cent.)			
	"Parallel."		"Hollow."	
R.P.M.	A.	B.	A.	B.
500	93	91	95	94
1000	94	92½	97	95½
1500	94½	92½	96	95½

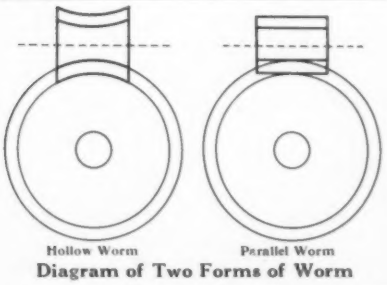


Diagram of Two Forms of Worm

In case A the pressure was 1 ton per square inch of projected area of tooth, and in case B, 2½ tons. It will be seen that the hollow worm is from 1¼ to 3 per cent. more efficient than the parallel worm, and that no great error will arise if the loss in the hollow worm be taken at the average figure of 5 per cent.

The following table of Mr. Lanchester's shows the effect of varying the pressure on the teeth of hollow worms of different gear ratios and at different speeds.

Effect of Pressure on Teeth on Efficiency at 30°–40° C

Gear ratio.	Pressure on Teeth. Lbs. per sq. in.	Efficiency (per cent.) at 1,500	1,000	700	400 R.P.M.
8/33	682	93.7	93.5	93.7	93.6
	1205	95.4	95.2	95.1	93.9
	1733	95.7	95.2	95.3	94.0
	2258	95.65	95.5	95.1	93.8
	2786	95.6	95.5	95.2	93.7
8/35	1200	95.65	96.8	95.4	94.6
	1727	96.1	95.7	95.4	95.1
	2780	95.75	95.4	95.2	93.1
9/34	1200	96.0	96.3	95.7	95.2
	1727	96.45	96.1	95.8	95.0
	2780	96.7	96.3	96.1	95.0

For touring cars there is no doubt that the worm drive (whether parallel or hollow) is quite satisfactory. For heavy vehicles, however, it is still on its trial, since the exceedingly heavy torques to be transmitted are liable to squeeze the lubricant out. Perhaps the "hollow" worm may have a successful field in this work. In Mr. Lanchester's opinion the "hollow" worm "will easily carry one ton per square inch, and is good for an overload of two or three times that amount, in fact, a load of two tons per square inch may be looked upon as a safe load, inasmuch as the gears will run satisfactorily with such a load for an indefinite period."

* F. W. Lanchester, in "Proc. I. A. E.", 1913.
† Extracts from the "Principles of the Application of Power to Road Transport:" by H. E. Wimperis, M. A., M. I. E. E.

FURTHER EVIDENCE OF HORSE BEING MORE DANGEROUS THAN TRUCK

Coroner Peter H. Hoffman, of Cook County, Illinois, occupied practically by Chicago alone, has published some figures which put an end to the groundless popular theory that motor trucks are more dangerous than horse wagons and other city vehicles. His conclusions are based on mileage, as naturally a vehicle which travels 2 miles has more opportunity of killing people than one which only travels 1. Equally as useful as the mortality figures are the figures on the number of different classes of vehicles, which apply to February 10, 1914. The report is in part as follows:

Kind of Vehicle	Horse	Motor
Number	65,118	37,406
Average daily mileage	12	42
Total daily mileage	781,416	1,571,052
Total accidents 1910 to 1914	6,047	5,784
Accidents per day	4.15	3.96
Average accidents per 5,000,000 miles	26.55	12.6

From the above it is seen that in traveling a mile, a horse vehicle is more likely to injure its passengers or other users of the street than a motor vehicle, the ratio being greater than 2 to 1.

NEW YORK TAXICAB COMPANIES COMBINE

The Yellow Taxicab Company and the Mason-Seaman Transportation Company, New York City, who have been at enmity with each other for several years, have consolidated and formed a new company. The two companies are each capitalized at $5,000,000. It is understood that some of the officers of each company will retire, and take no active part in the management of the new company.

Motor Truck Design and Construction Made Plain

Advantages and Disadvantages of Different Types Discussed

By C. T. SCHAEFER, Member Society Automobile Engineers

This is the seventh installment of a series of articles by this well-known writer, covering in a non-technical way the various constructions now current practice in commercial car design. These articles will take up, in order, the general types of chassis, the advantages and disadvantages of each, illustrated by simple diagrams, and in logical order, motor construction, ignition, carburetion, cooling, lubrication, etc., until each part of the truck has been dealt with

CARBURETION AND CARBURETORS

PART VII

CARBURETION is the term applied to the process of converting the liquid fuel into an explosive mixture. It comprises the vaporization of the fuel and the mixing of gasoline and air in the proper proportion to produce the explosive mixture drawn into the cylinders. The function of the air is to supply oxygen for combustion.

Air is a quantity of infinite variables, since its oxygen content for a given volume is proportionate to its temperature. The higher the temperature, the smaller the quantity of oxygen it contains, without any change of carburetor adjustment. It is accordingly advisable to use the air at the lowest temperature at which vaporization is possible.

The best proportion of air to gasoline varies between sixteen to seventeen parts of air to one of gasoline; however, this will be dependent upon the quality of the fuel.

Since the power of a gasoline motor is derived from the fuel which enters the cylinders during the suction stroke, it is of utmost importance that the mixture of fuel and air which is used by the motor, shall always be of exact proportions, so that when it is ignited by the spark, it will give the maximum force of explosion for a given quantity of fuel. If there is too much fuel or too little, within relative narrow limits, the action of the engine becomes objectionable.

Vaporization of fuel may be accomplished in two ways, by heat or vacuum; vaporization due to pressure reduction is distinguished from vaporization caused by the supplying of heat. In the vacuum method, vaporization is only partly complete, no matter how far the process of reduction is carried, since the part of the liquid, which vaporizes, does so through the abstraction of heat from the remainder, which becomes constantly colder until finally the temperature is so low, that vaporization ceases until heat is supplied from some outside source. When vaporization is brought about entirely by heat from an outside source, the degree to which it may be carried depends wholly on the amount of heat supplied, since the temperature of the liquid is being constantly raised to or maintained at the proper point.

In practice neither of the above processes are carried to the limit, but both act together. The reduced pressure, due to "motor suction," causes vaporization with a lowering of the temperature, and the heat of the air tends to cause vaporization through a transfer of heat from itself to the liquid. Each of these vaporizing actions assist the other; the air supplying heat to the liquid as it is cooled by vaporization under reduced pressure, and the reduction in temperature, due to pressure reduction, facilitating the transfer of heat from the air to the liquid.

The instrument which serves to carry out the above functions is known as the carburetor. Gasoline is stored in a tank, generally located under the driver's seat, and from here it is fed through a small pipe to a compartment of the carburetor called the float chamber, passing through a needle valve and strainer, which regulates the amount of gasoline entering the carburetor. To allow metal floats to be sustained in the gasoline they are made air tight and hollow, so that the needle valve can pass through them onto the valve seating. Somewhere near the top of the needle valve, small weighted arms are pivoted, the ends of which rest idly on the top of the float. The function of this float and chamber is to maintain a constant level of gasoline in its own chamber and the chamber in which the jet is located. The level in the latter chamber must be constant so as to prevent the gasoline flooding over the jet, which will cause faulty running of the engine. The action of the float is very much like an automatic water cistern, with its ball valve, for, as more gasoline enters the first chamber, the float rises, and with it the weights resting on it so that the needle valve is pushed down on its seating and shuts off the supply.

The other part of the carburetor called the choke tube, or mixing chamber, accommodates the jet and allows a stream of air to pass around it when the piston descends on the suction stroke. The float chamber maintains a constant level of gasoline in the jet. When the air rushes up around the jet, it draws with it a certain amount of sprayed gasoline, and, when the mixture of air and gasoline impinges on the sides of the inlet manifold, it becomes a gaseous mixture and enters the engine in this state through the inlet valve.

Just below the manifold flange of the carburetor, and in the choke tube, is located a throttle, which can be opened or closed by the operator from the lever on the steering gear or foot throttle. The more gas the engine can receive, the faster it runs, and the faster it runs, the more gasoline it is likely to draw from the jet. This would give an unduly rich mixture, unless means were provided for admitting more air, and thus giving the mixture approximately correct proportions. For this purpose an auxiliary air valve is provided, communicating with the choke tube just above the jet. As the engine speed increases, this auxiliary air valve opens and permits more air to enter, thus maintaining the proper mixture. It is a general assumption that more air must be admitted at high speeds, but this is not really correct; for, while we are admitting more air, we are merely endeavoring to keep the proportions of air and gasoline the same. Increased engine speed means increased suction on the jet, and naturally the liquid gasoline is drawn through faster than the air, so that more air must be admitted to compensate for the excessive suction. But apart from speed, temperature and humidity have their effect on carburetion. In the Summer, the air parts require to be opened wider than in Winter, as the atmosphere is less dense; also, when the air is damp and the barometer low, more air will be necessary.

The auxiliary air valves are generally suction operated, opening progressively as the suction increases from higher speed or some other cause. If these valves could be made to have no inertia, they would follow the suction exactly and their action would be ideal. But the fact is that they open and close late. Added to these faults, is that there is no way of operating them that is not subject to variation. If springs are used they will change in strength. A weight is effected by vibrations of the car, as is also a mercury bath with a float.

though to a less extent. In fact numerous methods have been experimented with and all found lacking in some respect.

There are many different makes of carburetors in use on commercial car engines at present. All carburetors which are used at the present time work by controlling the flow of gasoline in proportion to the air demand, some attempting this by raising the gasoline needle valve with the increased demands of the motor, such as the Schebler and Breeze carburetors; and others accomplishing this indirectly through various air regulations and auxiliary valves, as in the Kingston, Stromberg and others.

Some carburetors operate automatically, while others are so arranged that they may operate both automatically and mechanically.

This principle of automatic carburetion, which is employed in the majority of modern carburetors, may be outlined as follows:

A correct mixture having been obtained for the minimum suction on which the motor is capable of running, is compensated by the introduction of additional air at a rate varying automatically with the suction. The mechanical operation is obtained by connecting the butterfly valve, which controls the admission of gases from the carburetor, with the butterfly valve in the main air opening, the automatic operation of the auxiliary valve being retained.

During the past year there has been a tendency to provide dashboard adjustments, so that the mixture may be instantly varied throughout the entire range for heavier or lighter work, or because of other changing conditions. This is generally accomplished by varying the pressure of the auxiliary air valve spring. They are quite an advantage, as it is claimed that an automatic carburetor cannot adapt itself to changes in gasoline density, or in humidity, or to the gradual warming up of an engine when started from cold.

It would require too much space to illustrate all the various makes of carburetors used on the various commercial car engines, so the writer will present a few illustrations, which are explanatory of the various types discussed in this article, such as the raised needle valve type, the indirect type, and automatic and mechanically operated types.

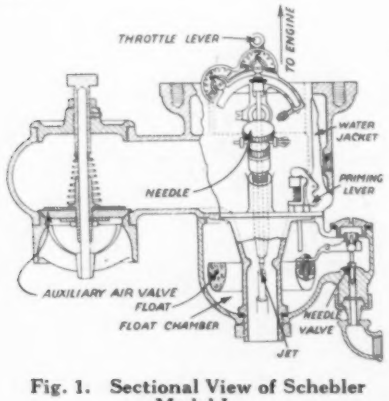


Fig. 1. Sectional View of Schebler Model L

This is a representative of the raised-needle type, the needle working automatically with the throttle.

Fig. 1 illustrates a sectional view of the Model "L" Schebler carburetor, which is of the raised needle type, and is so designed that the amount of fuel entering the motor is automatically controlled by means of a raised needle seating in the jet, working automatically with the throttle. The float and its chamber surround the main air supply in which the jet is located. The jet opening is controlled by a needle, which permits of a variable opening as the throttle is opened or closed, being operated by a cam on the throttle lever. The auxiliary air valve is controlled by the suction of the motor, while the mixing chamber is water jacketed to apply heat to assist in vaporization. The main air supply can also be connected with a drum around the exhaust manifold for supplying warm air.

Fig. 2 is an illustration of the Kingston carburetor, which is provided with an adjustable jet surrounded by the float and chamber. The main air intake communicates with the mixing chamber, while the auxiliary air enters through five circular openings arranged in a semi-circle above the mixing chamber, and controlled by floating balls. These balls are so arranged that they cannot become displaced. They operate automatically, gradually lifting from their seats as the motor suction increases. The air passing the openings guarded by the balls has an unrestricted passage into the mixing chamber, and then to the motor. The main air intake is fitted with a butterfly throttle, so that the amount of air can be reduced for starting, around the nozzle of the jet, is a well, which becomes partially filled with gasoline while the motor is idle. This is brought about automatically by the level of the gasoline in the float chamber being slightly higher than the top of the jet. This gives a rich mixture for starting, and as long as the

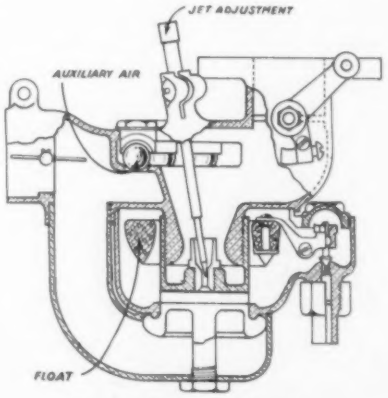


Fig. 2. Section of Kingston Carburetor

Motor suction lifts the balls from their seats, thus admitting the necessary auxiliary air

motor is running the gasoline is drawn through the jet into the intake manifold, the well remaining dry.

Some of the features of the Holley carburetor, illustrated in Fig. 3, are concentric float, adjustable jet, supplementary standpipe for starting and slow running and absence of air valves. Gasoline enters at "A," and passes through a strainer "F" and passages "H," into the jet. This jet is controlled by a milled screw, so that the opening can be varied at will. Gasoline passes into the jet "M," which is in the shape of a venturi, or double-ended cone, and also into the standpipe "J," to a level determined by the float. This standpipe leads to the edge of the butterfly throttle, and when the latter is closed, the suction of the motor allows gasoline to be drawn up into the standpipe, past the plug "K," and into the manifold. After the motor has been started, and the throttle opened, the gasoline is drawn through the main jet "M," mixing with the air that enters from below, through the conduit "N."

Fig. 4 illustrates the Pierce-Arrow automatic carburetor, with concentric float and adjustable jet. The gasoline supply from the tank passes through a fine gauze strainer, preventing water and dirt from entering the float chamber. The main air supply is taken through the lower inlet, and, coming from the proximity of the exhaust pipe, is warm, and passes up around the spray nozzle "A." The auxiliary air is taken through two reed valves, which are controlled by flat springs. When the engine runs slowly, both auxiliary valves remain on their seat, and as the engine runs faster, the more intense suction opens the lighter reed valve, admitting air above the

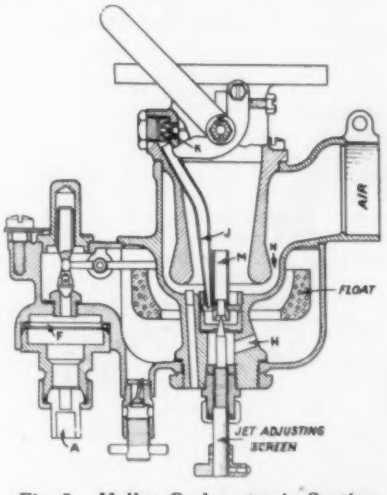


Fig. 3. Holley Carburetor in Section

There are no air valves. Gasoline flows into standpipe J; when the throttle is closed, motor suction draws this extra gasoline into the intake manifold, giving a better mixture for starting.

spray nozzle. A further increase in engine speed opens the heavier reed valve, permitting still more air to enter.

The Stromberg carburetor, Fig. 5, is a double jet type, featuring an eccentric float chamber with a glass wall, a feature which is typical of all Stromberg models. The flow of gases is controlled by a butterfly valve placed over the mixing chamber and immediately over the venturi, in which the main jet C is located. The second jet, J, comes into operation as the speed of the motor increases enough to permit the auxiliary air valve to open. The main air passage can be entirely or partially closed for starting purposes, and this operation also prevents the auxiliary air valve from opening, the latter being of the mushroom type, provided with two adjustments. The

valve has two spindles, one above and one below the seat, each spindle having a spring encircling it, finer adjustment being claimed for this construction. The body of the carburetor is not water jacketed, heat being supplied through the open air pipe from a drum surrounding the exhaust manifold.

The features of the Carter carburetor, illustrated in Fig. 6, are eccentric float, shock-absorbing needle, valve control and vertical multiple jet fuel tube. Gasoline enters the float chamber in the usual way. However, the needle valve is provided with a small shock absorber, as no permanent connection is made between the float and the lever controlling this valve.

The tube, located in the funnel, has a multiplicity of small holes arranged spirally around the tube, and, as a vacuum is

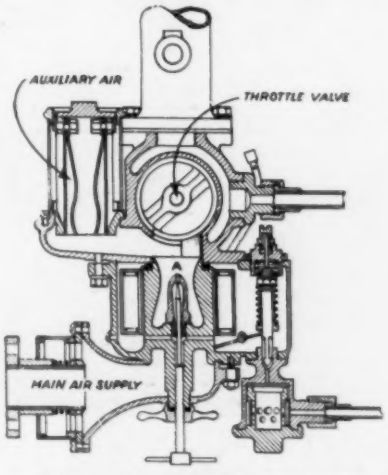


Fig. 4. Section of Pierce-Arrow Carburetor

Auxiliary air is controlled by two reed valves, controlled by flat springs. The greater suction increasing engine speed opens first the lighter reed valve and then the heavier, giving proportionate increases in auxiliary air.

created in the carburetor by the suction of the motor, the fuel rises and falls instantaneously in the tube, according to the speed of the motor. As the fuel rises in the tube, it is sprayed out of the jets, and, owing to the minuteness of the jets and the force with which the fuel emerges, the gasoline is broken up into very small particles and converted into a mist. The spiral arrangement of the jets insures each one a separate supply of air. This fuel tube is adjustable for low speeds, while the intermediate adjustment is obtained through the auxiliary air valve. The high speed adjustment is an air control in the funnel carrying the fuel tube. A strangling tube connected with the float chamber is also provided for easy starting.

Many of the so-called carburetor troubles are not really the fault of the carburetor at all. Air leaks along the path of the gas in the cylinder will upset the action of the best carburetors made. The air leaks may be caused by defective gaskets between the manifold and the cylinder, or manifold and carburetor, or by loose studs, nuts or cap screws in these connections. These air leaks destroy the quality of the mixture, and also reduce the vacuum created by the motor, so that a much smaller charge enters the cylinders. Mixture proportion may also change, due to some disarrangement of the auxiliary air valve, as by the slackening of the nuts controlling the spring. On the present-day models this difficulty is overcome by locking these nuts with split pins. Another source of trouble is the stoppage of the feed line from the tank to the carburetor, due to foreign matter

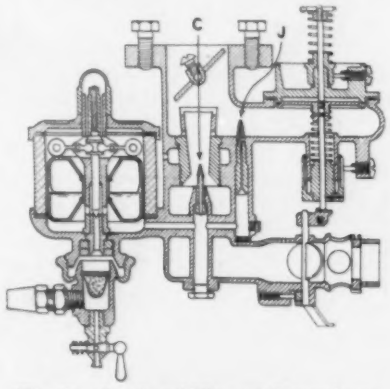


Fig. 5. Sectional View of Stromberg Carburetor

This is a double-jet type, the second jet, J, coming into play as motor speed increases. The auxiliary air valve has two spindles, finer adjustment being claimed for this construction.

in the gasoline. There is a noticeable tendency this year towards the use of strainers to remove these impurities.

The general concensus of opinion among the makers of carburetors is that, for commercial car motors, the mixture should be heated by some means before entering the cylinders. There are numerous ways of accomplishing this, by water jacketing the carburetor or intake manifold, and by supplying heat from the exhaust manifold, either directly to the mixture, or by a heat jacket around the mixing chamber of the carburetor.

Carburetors are made with or without water jackets, while the hot water supply is generally taken from the pump through a small pipe and returned to the cylinders. The flow is controlled by shut-off cocks, so that it may be shut off during the summer months, when better results are obtained without the aid of heat. Hot air from the exhaust manifold may be circulated and controlled in a like manner.

In some motors, part of the intake manifold passes through the water jacket of the cylinders, so that heat is supplied to the charge. The direct method is by connecting the main air pipe of the carburetor with a drum, placed around the exhaust manifold, so that the air is always preheated.

It is quite difficult to state which of the above methods are the best, as this is to some extent dependent upon the design of the carburetor. One method might work well on a certain carburetor and absolutely fail on another make.

Carburetors are generally bolted to flanges of the intake manifold; however, the heavy vibrations existing in commercial car operation have led some makers

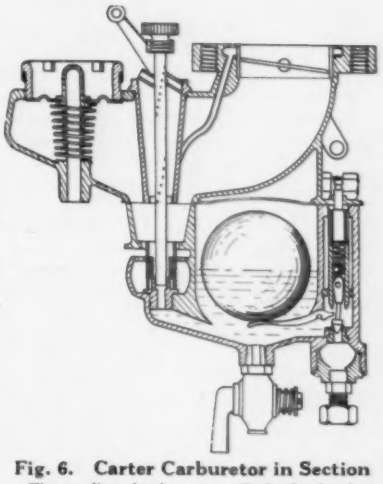


Fig. 6. Carter Carburetor in Section

The needle valve has a small shock absorber, and no permanent connection is made between the float and lever. A series of small openings are arranged spirally around the tube; a greater motor suction causes the fuel to rise higher in the tube, and to pass through openings into the mixing chamber.

to provide separate brackets on the crank case of the engine to take the weight of the carburetor and to prevent the adjustments from becoming disarranged due to the vibration.

CROPS HAULED PROFITABLY BY MOTOR TRUCK

An enterprising man, who purchased a five-ton truck to haul crops in the southern part of California, was successful in making a considerable amount of money. The Tulare Lake lands yielded an exceedingly large crop of wheat, and in consequence many thousand sacks of grain had to be hauled a distance of from 12 to 25 miles. Every available horse was pressed into service, but the work went slowly. By attaching two or three trailers to the truck, he was able to take as high as 12 or 13 tons of grain on a trip, and rarely exceeded a speed of 4 or 5 m.p.h. He landed his last load, which was the biggest, about midnight, making this trip at the rate of 3 m.p.h. He estimated that he hauled with his truck and trailers more than 12 four-horse teams could handle, and his gross earnings per day were over $100, or a total during forty days' work he cleared between $2500 or $3000.

The Tidewater Southern Railway Company, Modesto, Cal., has opened an auto bus line between Modesto and Turlock. Auto bus service will also be started from Stewart Station via Riverbank to Oakdale about the third or fourth week in March, and from Turner Station via Manteca to Ripon about the second week in April. Three round trips daily will be made. The auto car line will operate under the name of Tidewater Transportation Company. By these auto bus lines every city and town within 70 miles of Stockton will be brought into direct communication with Modesto and Stockton.

FOLLOW MAIL CAR—NEW TRAFFIC DODGE

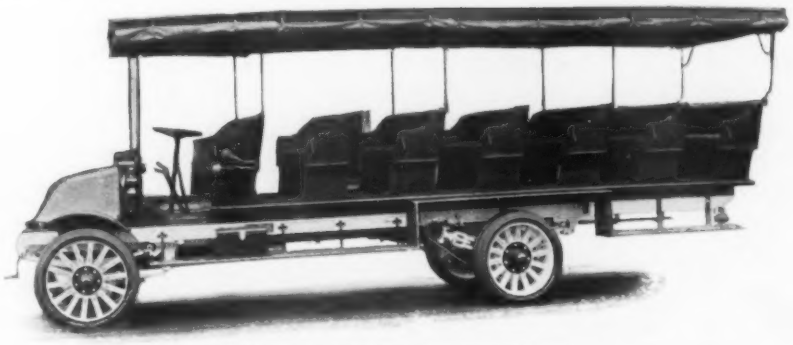
"I've been driving a car through city traffic for several years but I learned something to-day that I'll pass along," remarked the veteran motorist. "Follow the mail car. That's the sum and substance of it all. If you happen to see one of those delivery cars with 'U. S. Mail' on it, going your way, catch step, if you can; you'll be able to run every crowded crossing on any avenue in this broad land.

"It was purely accident in my case. I was in a hurry and sighed when I drifted up to a traffic cop, just as he had started a stream of cars and horse-drawn vehicles, across my route. As I slowed down, a mail service car came past me on the outside. The cop gave one look at the mail car, stopped the stream that was starting across our path, and gave us the go-ahead. He almost caught me off guard, but I managed to fall in behind the mail wagon, and simply ran every crossing for a mile.

"My experience made me curious and I asked a friend of mine in the postal service if it was customary for the mail wagons to get that preference. "'You bet it is' was his prompt reply. 'If those cops didn't give the mail wagon boy the go-ahead, he'd probably jam right on through without it. For he's running on schedule with all the rights of a mail train on a railroad, and with the whole prestige of the Federal Government behind him. "'They might not hang a policeman for treason, if he tried to stop one of those cars but they'd sure make it hot for him.'"

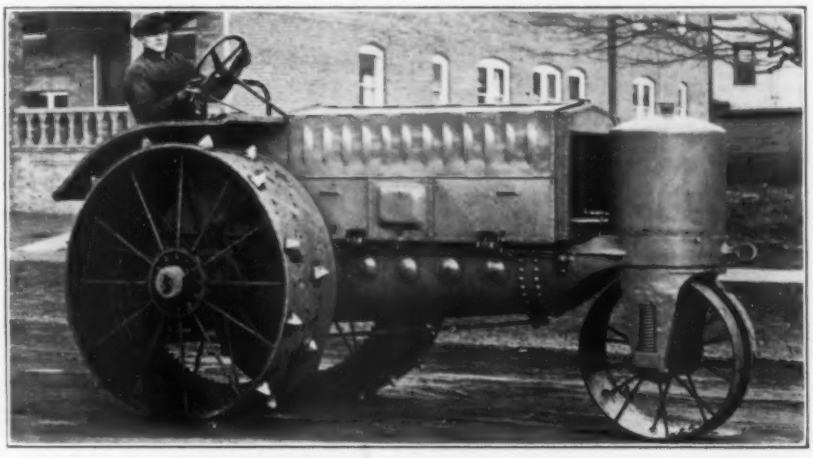
The veteran motorist might have carried his investigation farther with discoveries that would probably have been just as interesting. He would have found out that virtually all the motor cars which carry mail about every large city are owned by contractors who give heavy bond to indemnify the government against tardiness. Even a minute off schedule lays them open to fine.

Many of the contractors have worked the delivery system to a finer point than any department store, and have their men working under the orders of a trained despatcher. The wisest ones are already standardizing their equipment so far as possible, using light, fast, handy, delivery cars for standard use, with large trucks for heavy work between railroad stations and the main points of delivery.



Adams Twenty-two-Passenger 'Bus

Mounted on Model E, two-ton chassis, with a special wheelbase of 160 in.; manufactured by the Adams Brothers Company, Findlay, Ohio



Wallis Fifteen–Twenty Ton Tractor

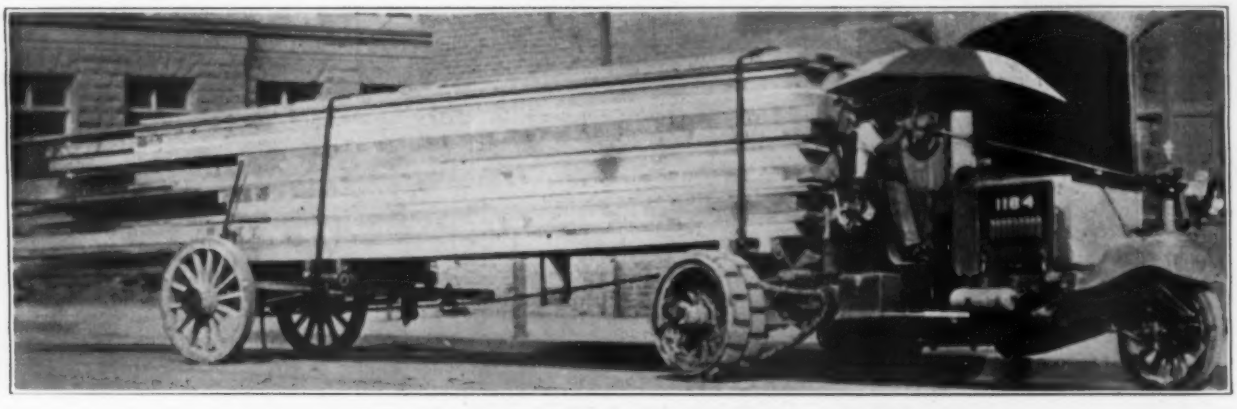
Four-cylinder, four-cycle, water-cooled, 6 x 7 in. motor; two speeds forward and one reverse, giving 2.15 and 3.5 m.p.h.; driving wheels 60 x 20 in., with angle irons or spur grousers optional; front wheel 34 x 14 in. running on Hyatt bearings and controlled by cable from steering post; weighs 7500 lbs., and has a draw bar pull of 28 h.p. It is the product of the Wallis Tractor Company, Racine, Wis.

In Oklahoma City, Okla., fire protection is rapidly being brought up to a high standard of efficiency by the motorizing of the equipment. Two new stations in the northern section of the city will be erected in the near future.

Harrisburg, Pa., has voted $25,000 to buy motor fire apparatus.

The Fire Department of Baltimore, Md., has added two three-ton White trucks to its equipment.

American Express Company, Chicago, has furnished its drivers with placards directing them to give pedestrians the right of way, and to stop in all cases of doubt, so as to reduce the liability of accident.



A Knox-Martin Tractor, Used in the Hawaiian Islands for Hauling Lumber

This is one of two machines which are a familiar sight to Honolulu residents, and an indication of the strong American invasion of this little Pacific island empire

Motor Transfer Companies in Los Angeles

By C. L. EDHOLM

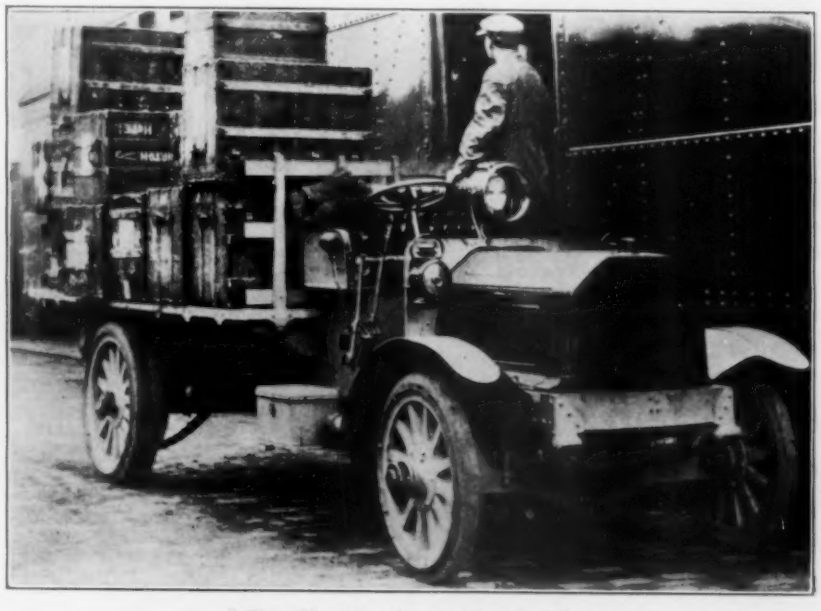
There are excellent reasons for the express and transportation business flourishing in Los Angeles, and equally good reasons for the displacement of the horse in that line.

The large amount of business between Los Angeles and the surrounding cities within a radius of 50 miles is one of the best reasons for the development of the motor transfer system. A wholesale house receiving an order by phone from a retailer in any one of a score of near-by cities can place the order at the customer's door within a few hours. In freighting by rail, the schedule would be something like this: goods sent to railroad on day of receipt of orders; goods received at suburban town on second day; goods delivered to merchant on third day—if he is lucky. Rehandling is saved, time is saved and money is saved, for on the boulevards of Southern California haulage costs are reduced to a minimum. Of course, with a horse-drawn truck this would be out of the question.

By arranging a schedule, it is possible to make the trucks pay a good profit both ways, as products of the ranch, or goods from the smaller town to the city, can be picked up daily.

An example of this is the Service Motor Express, which makes two round trips daily from Los Angeles to the west beach cities. This firm uses two two-ton Mack trucks, and carries a capacity load both ways, carrying fresh meats, canned goods, etc., to the grocers and butchers of the beach towns, and bringing back fish and general merchandise. A minimum of 25 cents for small packages is charged, and quite a good deal of general express business is secured.

The total operating costs per car per day are $9. For gasoline they average a gallon for 10 miles, and oil, 90 miles to the gallon. The average mileage for each truck per day is 50, over good roads. Quick delivery of such perishable goods as meats and fish is one of the important factors in this business, and this is made possible by the motor.



A Four-Ton Peerless in Transfer Work

In Los Angeles and near-by towns there are about twenty express and transfer companies, using from one to eight Mack trucks, a total of thirty-odd cars, ranging from one to five tons' capacity.

About forty-five firms in Southern California are making use of Autocars in the express and transfer business, one firm alone, the L. A. Transfer Company, using about twenty in addition to its horse-drawn vehicles. This firm does an extensive business in handling trunks, and, as Los Angeles is a Mecca for tourists, it is always busy in keeping up with its orders. The illustration shows a line-up of a few of its vehicles before the central office, where trunks are brought from the railroad stations and loaded for the various routes covered by different cars. It has not been possible to secure a complete view of the fleet of motor trucks, as some of them are always on the road.

A Few of L. A. Transfer Company's Machines

Parts of the Fleet of the Priver's Auto Delivery

Motor Saves One Dollar per Thousand Feet of Lumber Hauled

The locally built Moore and Moreland trucks are securing a large proportion of the transfer business, while the Peerless has an order of fifty for immediate delivery to a corporation which is making a bid for hauling lumber from the harbor, about 20 miles distant.

In this field alone there is a great future for the heavy truck in Los Angeles. It is claimed that about a dollar a thousand feet can be saved by lumber dealers, hauling by motor truck instead of freighting by rail between Los Angeles and the sea. The

Knox-Martin tractor is put to excellent use in this way, as well as a number of heavy trucks. Both San Pedro and Redondo are important lumber ports, and the roads between those cities and Los Angeles are exceptionally fine.

Motor Trucks in Active Competition With Railroads

Twenty of these Peerless trucks have been delivered for immediate use by this Los Angeles corporation, which is entering into active competition with the railroads for freights between Los Angeles harbor and the city. The Motor Truck and Terminal Company is a merger of various smaller transportation companies, which have united in order to systematize the short haul business in Southern California. The firm has secured 3½ acres of ground at Third Street and Central Avenue, near the heart of the wholesale section, where the storage and terminal facilities will be convenient for prompt service.

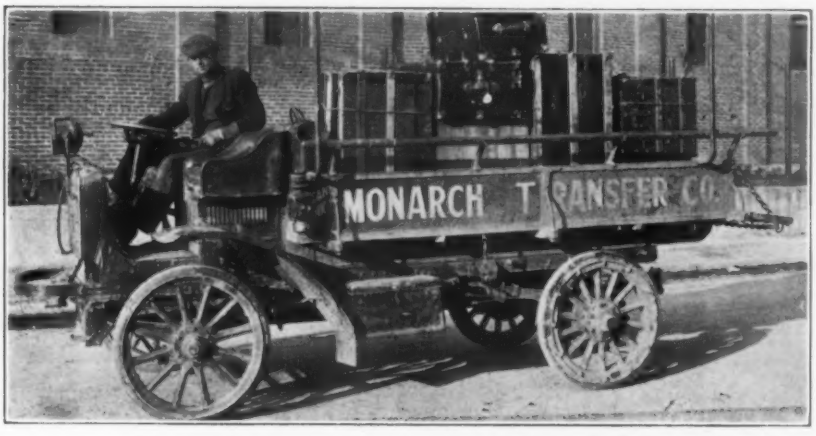
Not only the harbor of San Pedro (Los Angeles harbor), but a score of suburban cities will be served by this company, and, with the excellent system of good roads connecting them with Los Angeles, the time and cost of freighting can be materially reduced.

A great variety of merchandise and produce will be hauled both ways; lumber and building material from the harbor, manufactured goods from the jobbers to the out-of-town retailers, and farm and garden products from the nearby ranches to the city markets.

The initial order of $250,000 worth of trucks indicates the extensive scale on which the new firm is operating. The use of a single make of machine is to render every driver available for the operation of any truck at a moment's notice. The repairs and stock of extra parts can be reduced in this manner as well.

Bekins Van and Storage Company Are Big Truck Users

Three-Ton Mack for Interborough Work

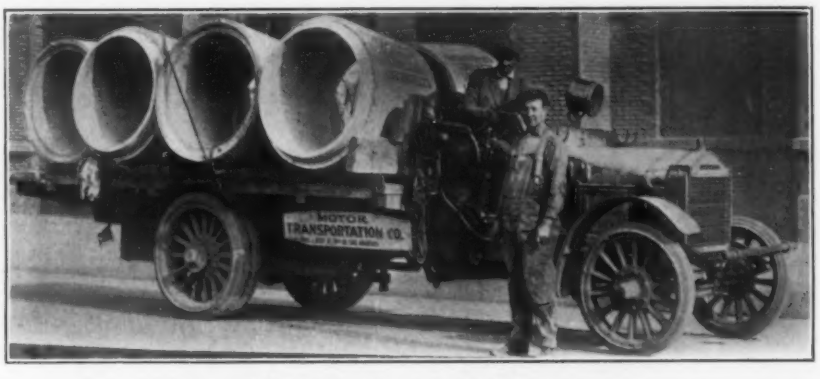


An Ocean Park to Los Angeles Transfer Truck

MOTOR FIRE DEPARTMENT MAKES LONG RUN

Responding to an alarm more than 20 miles away, seven engine companies of the Los Angeles Fire Department demonstrated the value of a motor fire equipment recently at a big fire in the San Pedro lumber yards. Although this harbor city is a part of Los Angeles, it is more than 20 miles from the city proper but it is connected by a splendid boulevard. When the chief of the harbor department saw that the blaze was beyond control of the nearby engine company, he telephoned to the city and seven motor engines were soon on their way, arriving on the scene in time to save 10,000,000 ft. of lumber. Though the fire was destructive to the extent of $200,000, yet it would have totaled millions of dollars but for the prompt response of the motor-driven engines. Los Angeles claims to rank second in the value of its motor fire equipment, following the lead of New York City. Chief Eley is ambitious to dispense with horses in the next few years, as the western metropolis extends over such a large area that only motors can cover the long runs required.

This is not the first time that the local department has responded to calls from a distance. At the time of the Ocean Park fire a couple of years ago, which wiped out the pleasure pier and a large part of the business section, the Los Angeles motor engines were sent over the 20 miles to the beach at a sixty-mile clip and rendered efficient service.



Pierce-Arrow in Freight Business

Owned by the Motor Transportation Company, Los Angeles, Cal., and has traveled 19,054 miles, and delivered 5450 tons of freight in nine months. On this work it has averaged 5.2 miles on a gallon of gasoline and 261 miles on a gallon of oil.

Kelly Motor Truck Company, which recently reduced its capital to $5,000, is in no way connected with the Kelly-Springfield Motor Truck Company, Springfield, Ohio.

The Brooklyn Alcatraz Asphalt Company, Brooklyn, N. Y., has bought nine five-ton White power dump trucks for hauling and dumping street paving material.

From ACROSS the WATER

COMMERCIAL CAR EXHIBITION AT MANCHESTER

FOR some years now an exhibition, in which commercial cars have figured prominently, has been held at Manchester for the convenience of people in the north of England; and it is a fairly important show, for it must be realized that the district around Manchester is as populous as that of London, and though administratively divided into many towns, is in reality one big populated area containing over eight million inhabitants. This year the exhibition was to have been held in a large building at Rusholme, but just before the opening, the building was burnt down by suffragettes. Consequently, plans had to be changed at short notice, and pleasure car and commercial car exhibitions were held separately, the former at the beginning, and the latter at the end of the month.

This year's commercial car exhibition showed a steady if not remarkable advance, but there was little calling for special individual remark. In Great Britain the demountable body for avoiding loading delays still hangs fire, in many cases owing to difficulties of space in the narrow yards where the vehicles have to load up, but none the less its possibilities are not properly realized.

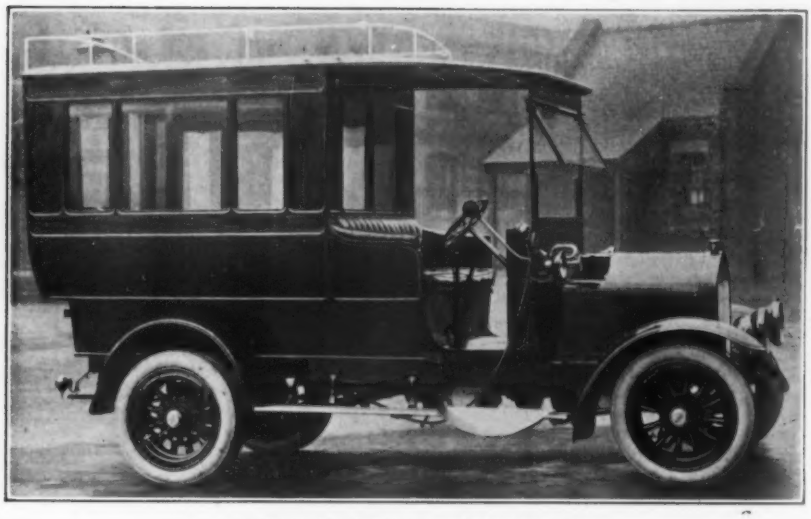
The chief features of the exhibition were the passenger cars—char-a-bancs—which are becoming tremendously popular, especially in the north of England, some seaside towns affording profitable investments during the season as passenger carriers, and with a change of body as goods carriers for the rest of the year. In towns like Yarmouth, where the fishing season is at a different time of the year from the tourist season, the possibilities in this direction are considerable, though there is one strong section that maintain that these two-purpose vehicles are not satisfactory, and that, for a machine to give good results as a char-a-banc, it ought to be specially designed for the work, so as to offer a proper distribution of weight on its wheels.

As regards chassis design, the tendency seems more and more towards the live axle, generally with a worm final drive, and the placing of the change speed lever to the inside of the driver's seat is a feature which seems to have found more favor on the commercial than the private car in Great Britain, where the driver's seat is always on the right hand side, owing to the rule of the road. It certainly is a distinct improvement to have the change speed lever by itself and distinct from the brake lever, especially on vehicles that may at any time call for the services of a strange driver.

A Handsome Dennis Char-a-banc With Patent Dennis Hood
The ends of the hoop sticks are fitted with rollers that travel along the rail seen at the side

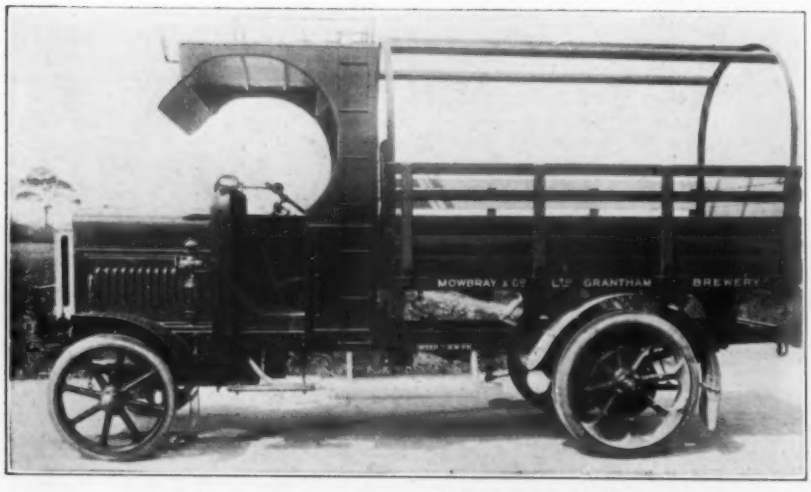
A Four-Ton Halford Special High-Sided Brewer's Wagon
The sides are divided into two sections, and made detachable, so as to give two different heights of side

A Handsome Design of Albion Van for the Drapery Trade



A Wolseley Station and Hotel 'Bus
A type of vehicle coming more and more into use in Europe

A Karrier Truck Built by Clayton & Company, of Huddersfield, to British War Office Subsidy Requirements



A Small Type of Brewer's Truck by the Leyland Company
It is chiefly for mineral-water transport

SOME POINTERS IN EUROPEAN WORKING

By OUR FOREIGN CORRESPONDENT

IN an article on "Business Motor Running Costs" read before the Coventry Graduates' Section of the British Institution of Automobile Engineers, Mr. D. S. Heather, B.Sc., gave the following figures as a rough average of gasolene consumption for varying loads:

1 ton	10	miles	per	gallon
2 "	10	"	"	"
3 "	8	"	"	"
4 "	7	"	"	"
5 "	6	"	"	"

Gradients, it was said, do not affect the consumption nearly as much as might be expected, while road surface plays an important part, and a difference of 10 per cent. in consumption as between winter and summer is quite common.

The author gave the proportions of the various items in working costs as follows:

	Percentage
Interest at 5 per cent.	4.55
Depreciation at 15 per cent.	11.83
Rent	2.60
Insurance	1.95
Petrol at 30c.	27.05
Oil and grease	1.95
Tires	24.72
Wages at 35c.	11.83
Repairs, etc.	13.52
	100.00

A small point but one of some importance was made by Mr. Heather in insisting on the importance of suitable grease, particularly for ball or roller bearings, and to the inadvisability of using any graphite in the oil, as it acts as an excellent lapping compound between the balls and the races. One particular case was cited of a North of England tramway undertaking, that had commenced motor 'buses as feeders to their system and experienced trouble with the roller bearings of the road wheels, which lasted no time. It was finally discovered that the greasers had been filling the hubs with oil containing flaked graphite in suspension, exactly as it was used on the tramway axles, and the substitution of this by good grease at once cured the trouble, so that the bearings now last practically indefinitely.

As an average of the working expenses for various sizes of vans the following figures were given in cents per ton mile: For one-ton vans $.0974, two-tonners $.0608, three-ton trucks $.0496, four-tonners $.0406, five-tonners $.0366.

To show the influence of daily mileage on running expenses Mr. Heather took the case of a three-ton truck travelling various daily mileages, and the following was the gist: Cost per ton mile for 100 miles a day: $.0496, 80 miles a day $.0544, 60 miles a day $.0613, 40 miles a day $.076. Assuming a journey of 10 miles out and 10 miles back with 20 tons to be carted each way, and assuming in the one case a four-ton automobile truck, and in the other two pair horse two-ton lorries, also assuming the lorry performs five return journeys a day against the horse vans' two, the cost of such work continued throughout the year for the lorry would mean $4250 against $6112 for the horse, showing a saving of something over 30 per cent. in favor of the automobile.

FOUR-WHEEL DRIVE TRIALS IN FRANCE

Entries for the trials being held from March 2d to 24th for tractors and wagons employing four-wheel drive include: Aries, Balachowsky et Caire, Latil, Chatellon-Panhard and Renault. This type of drive has been attracting a great deal of attention in that country. These tests are being organized by the Administration for War, and, in the main, amount to daily journeys over more or less severe routes, ranging in length from about 40 to 72 miles.

There is talk of imposing a municipal tax on mercantile motors in the department of the Seine in France. This is arousing much opposition, for it also includes Paris. It is a curious commentary on the state of affairs in France that, while the government is doing its best to foster commercial automobile services and the development of the commercial car, local governments should tax the same industries, and this—if the suggested scheme of taxation be passed—very heavily, for it must be remembered that octroi duty is already paid on the gasoline used.

TO ORGANIZE INSTITUTE OF PETROL

As far back as 1900 we have had petrol congresses in Europe, and Paris, Liège and Bucharest have all been the scenes of their deliberation.

Now, from the Minister of Commerce in Roumania comes a proposal that under the name of the Institute of Petrol an international organization shall be founded by the great Powers, the purpose of the Institute being to study not only the technical and commercial side, but matters of international rights pertaining to gasoline.

MOTOR EXHIBITION AT BOULOGNE-SUR-MER

A motor exhibition is to be held in July next at Boulogne-sur-mer, with a view to encouraging automobile transport in connection with the fishing industry. Already during the last three years sixteen new motor trucks have been purchased in Boulogne alone, and all round the coast there is considerable need of improved transport facilities which apparently the motor alone can afford.

England Motor Bus Companies, which have been engaged in competition with the steam railways, are now preparing to link up forty different cities and towns, which will require the placing of over 1000 motor buses on the public highways of the country. The Greater Omnibus Service Company, Ltd., has issued a challenge to the Royal Commission on British Railways, to carry a given number of passengers over an average railway distance at a superior speed and at less cost than can be done by railways.

London County Council will in all probability buy twelve motor fire engines at $4325 each; eleven motor "escape-vans" at $3200 each, and a motor tender at $2000.

A motor stage line has been established in Arizona between Mesa, Tempe and Phoenix, with a Rea 1½-ton truck.

A Thornycroft Lorry With High Side Doors and Aveling Wind Screen Fitted to the Driver's Cab

The wind screen is simply a pivoted glass with spring roller blinds fitted top and bottom on the lines illustrated

A Smart Laundry Delivery Van With Large Body Space

Owing to frequent dismounting for deliveries no side doors are fitted

A Pagefield Three-Tonner Built to Qualify for the British Army Subsidy

1914 Little Giant—A Four-Cylinder Car

OWING to the demand for a four-cylinder auto truck, the Chicago Pneumatic Tool Company, Chicago, Ill., has incorporated this feature into the new 1914 model of the Little Giant car. In addition to the four-cylinder feature the new model has a 4-in. steel channel frame, and selective type transmission, three speeds forward and one reverse. This machine will sell for $1350, chassis only.

The Motor

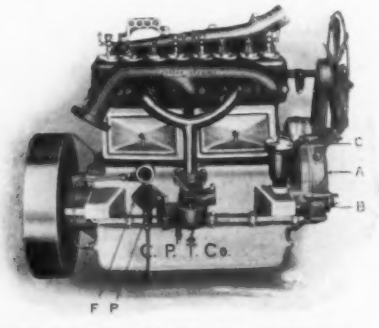
The motor of this new effort is located under the seat and footboards, where careful designing has made it very accessible. This construction prevents undue overhang, and gives a greater loading capacity on a smaller wheelbase, allowing easier operation in narrow quarters.

It is a four-cylinder, four-cycle, water-cooled motor, with cylinders cast en bloc, and a bore and stroke of 3¾ in. and a stroke of 4½ in. The main and connecting rod bearings are ample size for commercial use. The crank shaft is forged from the best quality of open-hearth steel and is 2⅛ in. in diameter. All valves are 1 7/16 in. in diameter and are mechanically operated. Valves are enclosed, but equipped with removable covers that they may be dirtproof and dustproof

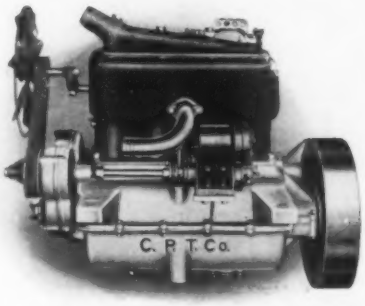
The crankcase is divided at center. The flywheel is bolted to a flange, integral with the crank shaft forging.

The cam shaft is constructed from tool steel. The cylinders, pistons, piston rings and piston pins are ground to size and lapped, thus insuring a perfect fit. A 1¼-in. standard Holley carburetor is used.

Cooling is by the thermo syphon system. The top tank of the radiator has the screen so located as to spread the flow of the incoming hot water, thereby hastening its cooling and returning it from the bottom tank to the water jacket at the proper temperature for again absorbing the surplus heat. The top and bottom tanks are connected by oval vertical tubes of copper, which are supported by horizontal fins of the same material, these fins, themselves, being reinforced in front. A wooden dashboard, extending above and beyond the radiator, serves the purpose of adding rigidity and, being fitted with handles, facilitates entering or leaving the car. A Kingston dual magneto is used for ignition, with dry cells as auxiliary. The motor is fitted with a sight-feed oil pump, the sight-feed being attached directly to the outlet of the pumps, so that the operator is always able to ascertain the pump's condition.



Right Side of Little Giant Motor



Left Side of Little Giant Motor

Transmission and Jack-Shaft Assembly

The drive is from the motor through a double universal joint to the transmission and jack shaft assembly. This construction overcomes the bad effects of uneven road conditions on the motor. The final drive is through the jack shaft to side chains (one right and one left), with rollers ⅝ in. diameter, ⅝ in. long and 1 in. pitch.

The transmission is assembled as one unit, and consists of the jack shaft, differential and clutch. It is especially accessible for adjustments. It is of the selective type, with three speeds forward and one reverse. The clutch is the multiple disc construction, made of hardened steel plates. These plates run in oil and are controlled by a foot lever. The clutch is attached to the front of the transmission case, the entire unit being mounted three-point suspension.

There is a stuffing box between the clutch and transmission cases, permitting the use of grease in the transmission and light oil in the clutch. This insures the best possible lubrication of these important parts.

Little Giant With Body Attached

The motor is carried under the seats and floorboards, to secure a greater loading space

Frame, Springs and Axles

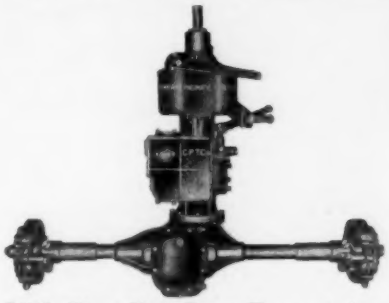
A substantial 4-in. channel frame is used, with cross ties of the same material. The entire frame assembly is riveted together, hot, by compressed air.

Both sets of springs are semi-elliptic. The front springs are 40 in. long and 2¼ in. wide, with eight leaves. The rear springs are 42 in. long and 2¼ in. wide, with ten leaves. These are assisted by an auxiliary spring 28 in. long, 2 in. wide and having five leaves; it is parallel to, and works on, the rear axle.

The front axle is 1½ x 1 in. wide, with 1 11/16-in. spindle, drop-forged. The rear is 2 x 2 in., with 1 5/16-in. spindle, drop-forged.

Wheels and Brakes

Little Giant wheels are very sturdily built out of second-growth hickory, and contain fourteen full-round barrel 1¼-in. spokes. The wheels are 36 in. in diameter. They are fitted with demountable rims and solid tires, 3 in. front and 3½ in. rear. The manufacturers have provided double external contracting service brakes

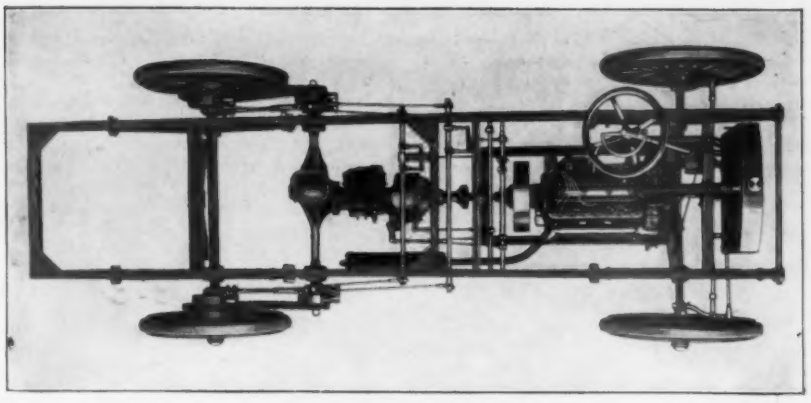


Little Giant Unit Power Transmission Plant

Includes differential, gear case and multiple-disc clutch

on the jack shaft, and these are operated by a foot lever. The emergency brakes, which are also double external contracting, are operated by a hand lever.

This company produces a standard line of bodies for general purposes, but is equipped to supply special bodies, built to the specifications of customers. All bodies are sold at a price additional to the chassis price at $1350, but this quotation includes seat and footboard frame.



Plan View of Little Giant Chassis

There is a universal joint between the motor and the clutch, which is enclosed in a unit with the transmission and differential

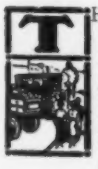
On the standard flareboard body the loading space is 44 x 114 in., height 13 in. The standard platform and stake body has a loading space of 44 x 114 in. and is 30 in. high. The standard open flareboard body with canvas top is also 44 x 114 in., but is 57 in. high. The standard colors are ivory white for the chassis with either style body. For bodies, Yale blue. Bodies will be painted to special order or lettered to suit purchaser at special prices, given on application.

The Little Giant wheelbase is 110 in., and the weight of the load is distributed according to regular express wagon practice. The tread is standard—56 in.; the weight varies from 3000 to 3800 lbs., depending upon the style of body and the equipment.

The speed is regulated from 4 to 20 m.p.h., depending upon the work to be done and according to the load and road conditions. The equipment consists of two oil lamps, tail lamp, tools and electric horn and full set of mud guards furnished as chassis equipment.

The Wagenhals 1914 Delivery Car

By HUGH DOLNAR



THE Wagenhals Motor Company, No. 668 Grand River Avenue, Detroit, Mich., offers for the year 1914 a single model three-wheel chassis, having a two-passenger seat in the rear over the driving wheel with a hood over the passengers, and two forms of package room in front, one open and one entirely enclosed. This Wagenhals delivery car is priced at $690, with either form of package space, as purchaser may select.

Mr. W. G. Wagenhals, M. E., designer of this three-wheeled delivery car, has been a railway construction contractor, designer of the first arc headlight, and designed and patented the third-rail system now used by the New York Central Railroad. He built two steam motor cars, for railroad use, and designed and built in November, 1907, the first gasoline driven fire engine, in which the gas engine which propelled the fire engine on the road also drove the pumps when working at a fire.

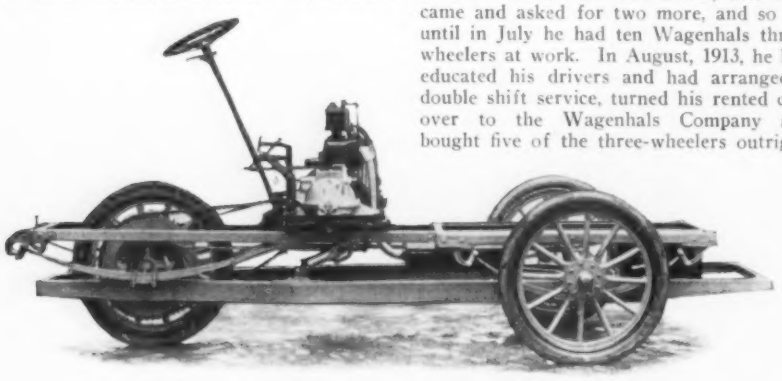
With this varied and successful mechanical experience behind him, and a cash capital of about $50,000, Mr. Wagenhals made a bold attack on the common roads transportation problem. He decided that the one-horse delivery wagon, being the most used, was most likely to pay good returns for a mechanical equivalent. The price of this motor delivery wagon Mr. Wagenhals fixed at about the cost of a good horse and harness and delivery wagon, say somewhere about $600 or $700, to meet the purchasing powers of the most prospective users, and decided that to make the really good lowest cost delivery vehicle the two-wheeled rear axle with its differential must be eliminated. This decision led directly to the three-wheel form of chassis, single driver in rear, loaded with the power plant and passengers to give road adhesion, and the package carrying box body in front, carried on a full length axle with steering wheels of ordinary fashion. This form of car would be handy in crowded streets, and could go head on to the sidewalk in much less space

The Complete Wagenhals Delivery Car

Wheelbase 80 in., tread 56 in. Two pneumatic-tired, wood front wheels, single "Motz" cushion-tired, wood rear wheel. Capacity eight hundred pounds. Price, $690, with open or closed body

than is required to back a horse-drawn delivery wagon up to the pavement so as to make the package space accessible, as is needful for rapid delivery work.

Mr. Wagenhals had his first three-wheel delivery wagon on the road at St. Louis, May, 1906, wheelbase same as now, 80 in., gauge 56 in., paying load 800 lbs., wooden wheel with 30-in. diameter, 3-in. pneumatic tires. This first Wagenhals three-wheeler proved altogether satisfactory.



Right Side of Wagenhals Chassis

Double-deck frame, to secure stability, carried on semi-elliptic springs. Front wheels have two circles of balls; rear has Timken roller bearings. Four-cylinder, four-cycle, 3½ x 3⅛ in. motor

The motor was an opposed pair of cylinders, four-cycle, water cooled, with 4-in. bore x 5-in. stroke, developing about 14 b.h.p. at 1000 r.p.m. The transmission was a planetary two forward speeds and one reverse change gear, with chain to the single rear driving wheel, maximum gear reduction 4 to 1.

Mr. Wagenhals, having thus made a thoroughly satisfactory working success of his delivery car, at once put it into practical test by loaning it for a week at a time to cover various delivery routes on which the horse-drawn wagon time with driver and helper, or with driver alone, was known, and very soon learned that the "head on to the sidewalk and direct back out" made a saving of about one-half of the standing-still time for each delivery.

Mr. Wagenhals backed his three-wheel car himself until 1912, when Mr. William Pflum, formerly First Vice-President and General Manager of the National Cash Register Company, Dayton, Ohio, joined in the Wagenhals three-wheeled venture, bringing ample capital, and organizing the Wagenhals Motor Company, capital stock $500,000.

The second model Wagenhals delivery car had a vertical motor, single cylinder, two-cycle and water-cooled, 5-in. bore, 5-in. stroke, about 6 b.h.p. at 1000 r.p.m. This motor used more fuel per mile than the former four-cycle motor, opposed cylinders, and was abandoned in favor of a 3½ x 3⅛, four-cycle, water-cooled Mason four-cylinder motor, showing 20 b.h.p. at 1500 r.p.m., which is now used and gives about 18 miles to the gallon of gasoline.

The first Wagenhals car was sold to the Ballantine Company, tailors, Detroit, 1910, in November. The second and final 1910 sales was made to Ph. Breitmeyer Sons, florists. In 1911 Mr. Wagenhals sold twenty of his three-wheel cars. In 1912 somewhere about forty cars were sold, Mr. Wagenhals being very busy making detail refinements in his three-wheeler. The sales rose to about eighty cars in 1913.

January 1, 1913, Mr. Wagenhals succeeded in renting two three-wheelers to the Parcel Post contractor of Detroit, who worked the two for two weeks, who then came and asked for two more, and so on, until in July he had ten Wagenhals three-wheelers at work. In August, 1913, he had educated his drivers and had arranged a double shift service, turned his rented cars over to the Wagenhals Company and bought five of the three-wheelers outright, running each car double shift, about 14 hours per day, and making the five do the work the ten had done before, thereby very much reducing his transportation costs.

This successful use of the Wagenhals cars in handling Detroit mail service attracted notice of the Washington postal authorities and led to a purchase order of twenty-one three-wheelers for the United States postal service, which were put at work in cities all east of the Mississippi and mainly south of the Ohio. All of these three-wheelers are giving entire satisfaction and some of them are working 18 hours a day.

The changes made between 1913 and 1914 in the three-wheeler related to the speed change and brakes, shown to be demanded in the heavy mail service, where as many as three hundred stops per day are made. The planetary gear transmission was retained, but put in heavier and better form, internal gearing, and a second brake was added on the rear wheel, all making for quicker start and quicker stop possibilities.

TRUCK INCREASES NEWSPAPER'S CIRCULATION

Motor-driven vehicles are now used extensively by newspapers in distributing their circulation and the number of cars thus employed is increasing very rapidly. The *Tribune* of Tampa, Fla., is a newspaper that has an unusually difficult problem of transportation to solve, as this journal circulates largely through the settlements along the west coast. The circulation department of the *Tribune* recently purchased a Commerce car and with this light delivery has worked a revelation in its distribution system. With the Commerce the *Tribune* can now be delivered to the coast cities at breakfast and the arrangement has not only facilitated distribution and placed it on a more economical basis but it has given the circulation a decided impetus upward.

Motor Truck & Terminal Company, Los Angeles, has ordered fifty motor trucks. The city of Chicago has purchased seven motor trucks—three one-ton Kelly trucks, and four Pierce-Arrows—one five-ton and three two-ton.

Left Oblique View of Wagenhals Chassis

A spark control at driver's right, located on the side of car, is not shown, as is also the latched emergency brake lever at driver's right. Speed control is by four pedals; three-disc clutch, with 8 in. effective diameter. Steering by 16 in. wheel through hardened steel worm and full worm gear, with adjustment by eccentric bushings. Throttle under wheel.

Morton Worm and Chain-Driven Trucks and Tractors

MORTON TRUCK AND TRACTOR COMPANY, INC., Nineteenth and Derry Streets, Harrisburg, Pa., is offering to the 1914 trade a very complete line of commercial cars for every purpose, the line comprising two, three and five-ton trucks in either chain or worm drive, a four-wheel, double-worm drive truck and a four-wheel drive tractor.

Two-Ton Worm-Drive Truck

This model has a four-cylinder, four-cycle, water-cooled, 4¼ x 5½-in. motor. Lubrication is automatic, with oil reservoir in bottom of crank case, oil circulation by means of a centrifugal pump. Oil pan is equipped with a float which shows the level of oil at all times.

Clutch is of the expanding disc, dry plate type. Transmission is of the sliding gear, selective type, three speeds forward and one reverse. All bearings, gears and shafts are of the highest grade material and of ample proportion to transmit the power of the motor continuously, without excessive wear or injury to these parts.

Rear axle is worm type with an 8 1/3 to 1 gear ratio. Track 64 in. Front is 2¼ x 3⅜ heavy drop forged, with 2 61/64 in. spindles and 1 11/16 in. steering knuckles. Bearings are taper-roller type. Track 62 in.

Frame is made of 5-in. channel steel—five cross members. All joints are hot riveted; all corners very rigidly reinforced with angle iron joints. On the bottom of each cross member there is a fish plate riveted to the bottom of the main channels making this frame absolutely indestructible. Two complete sets of brakes are provided, one set applied by the hand lever and known as the emergency brake, and the other operated by pedal and known as the service brake. Both these operate on the rear wheels; one being internal and the other external.

Springs are semi-elliptic front, 2½ in. wide and 42 in. long. Rear are of the platform type, sides 2½ in. wide, and 50 in. long, cross 2½ in. x 36 in. All springs are made from a high grade of electric manganese steel.

Wheels are wood artillery type, 36 in. front with fourteen spokes, 2½ in. diameter oval. Rear are 38 in., with fourteen spokes, 2¾ in. diameter oval, all made to standard S. A. E. dimensions. Tires are quick detachable, 36 x 5 in. front and 38 x 6 in. rear.

Three-Ton Chain Drive

This size has a 4½ x 6-in., four-cylinder, four-cycle motor. All of the different parts are large and amply strong to withstand hard service and wear. The cylinders are cast singly. The exhaust valve is located in the head of the cylinder in a cage which is removable by loosening two bolts. The intake valve is very accessible. Motor is water-cooled by means of a centrifugal pump. Lubrication is automatic splash system, by means of an eccentric pump. Carburetor is a special float and jet type with automatic compensating air valve. It furnishes a uniform mixture at all speeds, and is flexible and economical.

Plan View of Morton Worm-Drive Truck

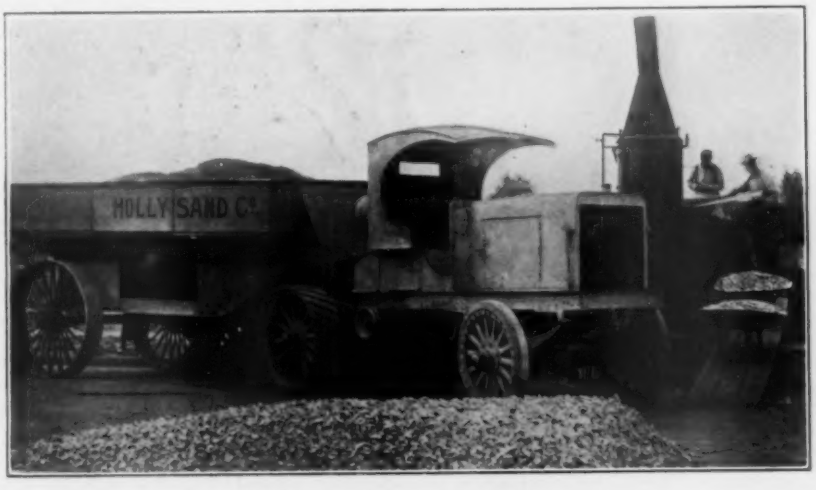
The clutch is dry-disc type. The transmission is made integral with the jack shaft, being supported by the same brackets that support the jack shaft. All the gears are large and of ample size to withstand any strains or stress put upon them. It is the three-speed, selective type. All the bearings are Hyatt rollers, and each is interchangeable. Jack shaft is of a high carbon, heat-treated steel. Bearings are Timken roller. Differential gears contained in the jack shaft are all made of a high grade of steel, heat treated. The ratio of these gears is 3½ to 1. Jack shaft housing is made from pressed steel, is very strong and substantially built. Radius rods have universal action at both ends, all moving parts being provided with grease cups. Pivot bolts are hardened and ground.

Front axle is 2¼ x 3⅜ in., heavy drop-forged, spindles and steering knuckles 2¼ in. diameter. Bearings are ball, track 60 in., and hubs are drilled for fourteen spokes, standard size spokes 2¾ in.

Rear is 2¼ x 3¼ in. with spring pads forged integral, spindles and steering knuckles 2⅞ in. diameter. Bearings are ball, track 64 in., and hubs drilled are for fourteen spokes, standard size spokes 3 in.

Wheels are of hickory artillery type, front 38 in. diameter, fourteen spokes 2¾ in. diameter, rear 40 in. diameter, fourteen spokes 3 in. diameter. Spokes are dovetailed together at the hub, forming a very rigid wheel. Standard tire equipment is: front 5-in. single sectional block, and the rear 5-in. dual sectional block.

Frame is 5-in. channel. There are six cross members in the frame. All joints are hot riveted and the corners very rigidly reinforced with 8 x 8-in. angle iron and fish plates on the bottom of the channels. There is no chance for twist or cutting loose in the joints. The width of the frame is 38 in. and the length is 186 in. Height from ground to the top of the



Morton Ten-Ton Tractor Trailer

Four-cylinder 5¼ x 6 in. motor; four-speed selective transmission; drive by chains to rear wheels

frame without load is 36 in. Semi-elliptic front springs are used. They are 48 in. long, and 3 in. wide. Rear springs are of the platform type, sides 50 in. long and 3 in. wide. The cross spring is 39 in. long. Springs are made of a high grade of spring steel. All spring eyes contain a bronze bushing which is interchangeable to take up the wear as it occurs. Clips are large and amply strong to withstand all wear and loads put upon them. They are forged of a high grade of alloy steel and are then hardened, giving them a very long life. Jack shaft sprockets are 18 tooth, and rear wheel sprockets 72 tooth. Rear sprocket is riveted to the pressed-steel brake drum, thus making the brake drum or sprocket interchangeable.

Steering gears are Lavigne, requiring no adjustment; very heavy and substantially built. The wheel is 20 in., positive, compact, dustproof and irreversible.

The service and emergency brakes are both on the rear wheels. An 18-in. pressed-steel drum is used, with sprockets riveted on to same. The emergency brake is an internal expanding type, self-intensifying. The service brake is an external wrapping type, very simple and easy to adjust when necessary to take up for wear. All brakes are perfectly equalized and are lined with indestructible Raybestos fibre, woven on wire mesh base.

Driver's cab is oak, and is permanently fastened on the chassis. Is large and roomy and fitted with curtains making it weatherproof. It is removable by taking out eight bolts. Driver's seat is large and roomy with deep upholstering. Capacity three persons. The seat is independent and removable from the body. The gasoline tank, located on the back of driver's seat, is made of heavy galvanized steel with reinforced partitions, capacity 30 gal.

Wheelbase is 130 in., tread 60 in. front and 64 rear. Equipment is complete tool kit, two side gas lamps, one oil tail lamp, horn with bulb and tube.

Five-Ton Chain Drive

This model is powered by a four-cylinder, four-cycle, water-cooled, 4½ x 6-in. motor, with cylinders cast singly. It is equipped with a governor controlling the engine at any maximum speed desired by the operator. Motor is also equipped with a Bosch magneto and a battery ignition system, one independent of the other. The bearings in various parts are of liberal size to withstand the wear and strains put upon them. Radiator, made by the Briscoe Manufacturing Company, is of the honey-comb type, separated by two studs in the bottom and two brackets on the side. The fan is located on the radiator and gives ample radiation to operate the motor continually on low gear.

The transmission is sliding gear, selective type, with four speeds forward and one reverse. The gears are large in diameter, have a wide face and are made from 3½ per cent. nickel steel, oil treated and hardened, making them practically indestructible. The shafts are nickel steel, hardened and ground to size. The transmission throughout is large in all proportions and will withstand the wear and strains far in excess of what they are required to do in this truck. Chains are Whitney pattern.

Front axle is drop forged, chrome nickel steel with a maximum carrying capacity of 15,000 lbs. Steering knuckles and knuckle joints are all fitted with Timken bearings and are provided with positive lubrication. Rear is forged from chrome nickel steel, maximum carrying capacity is 15,000 lbs. The features of this axle and jack shaft are Timken roller bearings in rear hubs and jack shaft, pressed steel rear brake drums which are 20 in. diameter and 5 in. wide. The rear sprockets are cut for 1¾-in. pitch chains with 1-in. roller and 1-in. face, fifteen teeth in front to forty-five teeth rear. Sprockets are bolted to the brake drums and are readily detachable for replacements. Hub caps cover the ends of the hubs and are held in position by three cap screws. Hub caps are also provided with a small oil cover to the side of which a grease gun can be attached for lubricating purposes without the necessity of removing hub caps. Radius rods are cast steel of wide section, pivoted and swiveled at each end.

Morton Four-Wheel Drive Tractor
Four cylinder 5¼ x 6 in. motor; to heavy selective transmission to four wheels through a worm drive

Tread is 70-in. Wheels are fourteen-spoke, 3 and 3½-in. diameter spokes, and 38 and 44-in. diameter. Tires are 6 in., single in front and dual rear, and springs are 42 x 4 and 50 x 4 in. manufactured of electric manganese steel. Frame is 8-in., heavy-weight, channel steel; all cross members being reinforced with angle irons in the ends, and plates on the top and bottom being riveted up with ⅝-in. rivets.

Steering gear is irreversible Lavigne type, with 20-in. wheel located on the right-hand side of the car. Body is made to customer's specifications, or standard express or stake body.

Tractor Truck

This model has a four-cylinder, four-cycle, 5¼ x 6-in. motor, with cylinders cast singly. It is equipped with Bosch magneto and an independent battery ignition system. The bearings and parts are made of liberal size to withstand the wear and strains put upon them. Radiator is of the honey-comb type and is supported on suspension springs, insuring it against leakage from over-vibration or twist, and is of ample size to keep the motor cool when operating the truck on low gear continuously. The fan, which is of large dimensions, is located on the radiator.

Morton Chain-Drive Truck
Four cylinder 4½ x 5 in. motor; four-speed selective transmission

Transmission is sliding gear, selective type, having four forward speeds and one reverse. The gears are chrome vanadium steel 1½-in. face, 5-in. pitch. Drive shaft is 2¼ in. diameter, counter shaft 2 in. diameter, mounted on large size annular and Timken bearings. The differential is exceedingly large, the bevels being 4-in. pitch, 2-in. face with differential lock. Driving chains are very large and ample roller type.

Front axle is drop forged, chrome nickel steel, very strong and sturdy. The bearings are of the Standard roller type and are provided with a positive lubrication. The rear axle is chrome nickel steel, and fitted with Standard roller bearings. All radius rods are steel forgings. All pivots, joints and radius rods, and rear axle are made of nickel steel, and are lubricated with hard grease lubricators.

Front wheels are 40 in., with fourteen 3-in. spokes and 6-in. tires. Rear are 42 in. with fourteen 3½-in. spokes and 6-in. dual tires. Front springs are 42 x 3 in., and rear 50x4 in., made of high-grade steel.

Steering gear is irreversible type with a 22-in. wheel on the right side. Frame is 8-in heavy channel steel. All cross members are reinforced with angle irons in the ends and fish plates on the top and bottom, these all being riveted up with ⅝-in. rivets.

Four-Wheel, Worm-Drive Tractor

This machine has a rated horsepower of 15 at the draw bar, with speeds of 1½, 3 and 5 m.p.h. and 1¾ m.p.h. on reverse. It has a range of speeds from 100 to 800 r.p.m. The motor is four-cylinder, four-cycle, vertical, with 5¼-in. bore and 6-in. stroke.

For stationary work belt can be used. Transmission is Morton heavy selective type, three speeds forward and one reverse. Transmission of power to axle is through the Morton Universal Worm Drive, the worm being nickel steel and worm gear being phosphorus bronze. The worm and gear operate in a bath of oil.

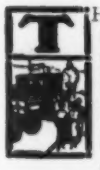
Axles are semi-floating type and nickel steel. Wheels are 50-in. diameter x 12-in. face, of the suspension type. The wheels are designed for attachable rubber tires or for standard traction wheel. Wheels track at all times. Standard wheelbase is 96 in. and tread 60 in. The machine weighs approximately 8000 lbs. Steering is done by the power of the motor, this being controlled at the will of the operator by a hand steering wheel which engages and disengages the proper gears, steering front and rear axles.

Service brake is on the universal drive shaft, this being used as an emergency to stop the machine very quickly. In the ordinary stop the machine will hold itself by the means of the worm and worm gear as in the natural course of stoppage they are a positive lock, but will not stop instantaneously. All gears are made out of cast steel.

The driver can be located on either end of the tractor, preferably on the rear end in plowing and heavy hauling. The engine is located under a hood which protects it from all dirt, dust and weather and permits easy access to all parts.

The Commerce One Thousand Pound Paying Load Light Delivery Car

By HUGH DOLNAR



THE Commerce Light Delivery Car, manufactured by the Commerce Motor Car Company, 630 Penobscot Building, Detroit, Mich., has been on the road since February, 1911, when the first Commerce delivery car made its appearance. This first Commerce truck was good for its day and age, was driven by a four-cylinder motor, piston 3¼ in. diameter with 3⅜ in. stroke, four-cycle and water cooled, wheel base 94 in., gage 56 in., with a friction transmission and chain to rear axle, semi-floating, nominal paying load, 1000 lbs. The price of this first car was $850, with panel body, three oil lamps, horn and tools, and a few of them found prompt sale and all of them are yet in commission and giving satisfaction to purchasers.

The first improvement in this car was made in June 1911, by adding 2 in. to the wheel base and bringing sundry minor details into better form. The work on the road was carefully noted and great care was taken from the outset to correct every fault as soon as noted. Fifty Commerce light delivery cars with 96 in. wheel base were sold within a short time, all giving satisfaction, that is to say, meeting the expectations of purchasers and staying together on the road.

The third Commerce model was placed on the road in December, 1911, this third attempt involving a real improvement at a vital point. The first fiber wheel shaft was 1½ in. diameter, 28 in. between bearings, and as a matter of course did not give ideal low speed driving. This fiber wheel shaft 1½ in. original diameter was increased to 2¼ in. bearings same distance apart, which gave shaft stiffness enough to make the low gear drive really efficient, so that this 2¼ in. diameter of the shaft, on which the fiber wheel slides to obtain speed changes, was regarded as of ample rigidity, and has been retained to the present time with no apparent need for change, and somewhere about four hundred of these cars found purchasers before any other important change in the chassis was made.

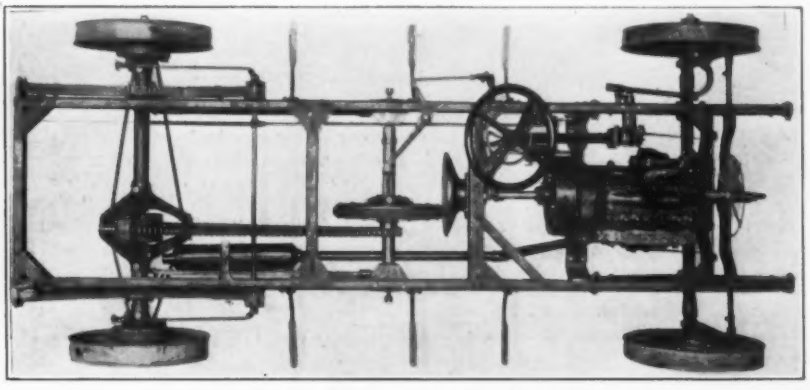
The motor was changed to a "Northway," four-cycle, water cooled, four cylinders, having pistons 3 in. diameter with 4½ in. stroke; the first motor had pistons 3¼ in. diameter with 3⅜ in. stroke. The Northway motor gave a better pull, owing partly to better workmanship and partly, of course, to the much longer piston stroke. This change to the Northway small bore and long stroke motor in January, 1913, was accompanied by a change from right-side to left-side driver's position, with left hand control and lengthening of the wheel base from 96 in. to 102 in., which brought the Commerce chassis to where it stands now. Up to the present time the Commerce delivery car, about eight hundred sold and in satisfactory use, has had only one brake, latched pedal applied, expanding brake shoes, Raybestos faced, enclosed in a pressed steel brake drum 10 in. diameter by 1¾ in. face.

Taken altogether this Commerce light delivery car has made a very successful

Commerce Light Delivery Car

Wheelbase 102 in.; gage 56 in.; tires 32 x 3½ in. Four-cylinder motor; friction transmission. $875

showing. Seventy-five of these cars are in daily use in Detroit, while the seven hundred and twenty-five others have gone to all points in the United States. The cars average about 14 miles to the gallon. The Northway motor is a prompt starter, gives no trouble at all, is fitted with Schebler Model O carburetor, which is reliable and satisfactory, and the large diameter fiber wheel on its stiff 2¼ in. diameter shaft gives a silent drive, all speed changes from 1½ m.p.h. on the level to 20 m.p.h. loaded, while the big fiber wheel gives quite unusually good hill-climbing powers, so that this pull up hill is one of the points of the "Commerce" which is mentioned with pardonable boasting



Plan View of Commerce Light Delivery Car
Showing four-cylinder, water-cooled motor; friction transmission; chain drive; left drive and control

Wheels are wood with ball bearings in front and Hyatt roller bearings in rear. Axles are Weston-Mott, tubular in front and tubular with sprocket housings in rear. Springs are all half elliptics. Front are 38 in. jointed in front and linked in the rear, six leaves, 1¾ in. wide, banded to second leaf. Rear springs are 43 in. long, linked at both ends, ten leaves, 1¾ in. wide, banded to third leaf.

The frame is manufactured by the Detroit Pressed Steel Company. Length over all is 137½ in., width, 32 in. There are five cross members and ample diagonal bracing, the third cross member, which carries the friction disc bearing, reinforced and supported by long diagonal braces. Frame side depth is 3½ in. and width 1½ in. The radiator is supported on the first cross member. The second cross member is deeply depressed to take the front end of the motor. The rear end of the motor is supported on angular down hangers, riveted to the frame sides.

Transmission

A flexible sheet steel diamond, 12 gage, 2 in. wide members spring temper, is fixed with two screws to the flywheel rim, constituting a flexible bail at rear of flywheel, to which the outer ends of a bail driver are riveted. This bail driver is keyed and pinned to the front end of the friction disc shaft. Also there is no sliding member moved by application of friction pressure to push the disc backward to give fiber wheel driving friction, the flexible diamond simply being forced to rear in applying pressure to the disc and springing to front to carry the friction disc forward when pressure is released. This avoids a separate spring to pull the disc forward, away from the fiber wheel, when engaging, pedal pressure is removed, all making for simplicity and reliability of action. The fiber wheel can wear down ½ in. on a side, making the maximum flexure of the spring steel driving diamond not to exceed ⅝ in.

The friction disc journal diameter is same as disc shaft diameter, 1⅞ in. The rear bearing is on Hyatt rollers, with New Departure ball thrust bearing. The gray iron friction disc, 20 in. diameter, is keyed, driven and riveted to rear end of disc shaft. The fiber wheel is 22 in. diameter, Rockwood tar paper 4000 to 5000 miles wear to one ring is used, with renewals at $5. Replacement can be made by an unskilled driver. The drive from the fiber wheel shaft to the rear axle differential sprocket is by Whitney Chain, No. 207, 1 in. pitch ⅝ in. rollers, with sprocket speed reduction 53-13 to 1.

Commerce Rear Axle
Weston-Mott manufacture; fitted with Hyatt roller bearings

Control

There are two latched pedals on the foot board; that at the right moves the friction disc to rear for engaging the friction drive. The latched pedal at left side applies the internal brake shoes. One hand lever is latched and is moved by the driver's left hand to change the speed. The throttle control is a friction-retained hand-lever on top of the steering wheel. The steering is by a 16 in. diameter hand wheel and a steel worm working in steel trunnion nut, all hardened.

This is well upholstered, and on the driver's side has a lazy back, upholstered and hinged to turn down forward. The right end of the seat has no lazy back.

THE MOTOR TRUCK TO THE RESCUE

February was a month of unprecedented rainstorms in and about Los Angeles, and traffic was tied up to a great extent. The superiority of the motor truck to ordinary means of transportation was demonstrated by the great number that went through the high water like cruisers. The school children were taken home by good natured truck drivers from various schools where they were marooned, and deliveries by that method were not seriously delayed in the case of firms that were fortunate enough to be properly equipped with commercial vehicles. The common term, a fleet of trucks, was most appropriate in this instance.

Motor Truck to Rescue

Commerce Friction Drive
Showing the flywheel and part of the spring-steel, diamond bail drive; the friction disc; the fiber wheel, and chain drive to rear axle

The American Motor Truck Company Brings Out Ton and a Half Motor Truck

By HUGH DOLNAR

THE American Motor Truck Company, 139 Beaubien Street, Detroit, Mich., was organized in December, 1913, with A. H. Reinhold as president, John D. McKay, vice-president and treasurer and John McKay, A. H. Reinhold and W. K. Ackerman, managing directors. This company will, for the present, build only one size of truck, to carry one and one-half tons paying load, on a chassis having a standard wheel base of 132 in. This wheel base will be extended to 156 in. maximum, and equipped with body to order to meet purchaser's special requirements.

Standard Specifications

The Standard construction details adopted for this ton and a half American are as follows. Wheel base, 132 in.; gage, 56 in. Wooden wheels, with demountable rims, front tires, 36 x 3½ in.; rear tires, 36 x 5 in., solid.

The front and rear axles are Weston-Mott manufacture from American Truck specifications; front axle is I-section steel drop forging 2⅝ x 1¾ in.; front wheels on Hyatt roller bearings. The rear axle is Weston-Mott "double reduction," first, a bevel pinion on the rear end of the propeller shaft drives a bevel gear, giving a first reduction of nearly 2 to 1; the bevel gear shaft carries a spur gear pinion, which drives the large spur gear housed in the axle gear casing, occupied by the bevel gear in the ordinary bevel gear drive rear axle. The large spur gear carries the three differential pinions in the usual manner, the rear axles being full floating, to the rear wheels which are also carried on Hyatt roller bearings.

The propeller shaft casing is in unit assembly with the rear axle gear housing and terminates at its front end in a globe bearing which houses a Kinsler-Bennett universal joint.

The springs, by the Detroit Steel Products Company, are half elliptics both front and rear. The front springs are 42 in. long, spring eye to spring eye, loaded, jointed in front, and sliding on the chassis frame under side in the rear. These front springs are 3½ in. wide. The rear springs are 54 in. long x 4 in. wide, linked in front and sliding under the chassis frame in the rear. The sliding spring ends, both front and rear, bear on hardened reinforced plates applied to the chassis frames underneath, and each sliding surface is fitted with its own heavy grease compression cup.

The chassis frame is by A. O. Smith, 3-16 in. thick, 5⅜ in. deep, 2 in. general width, flanged to 2⅞ wide at the side angles, and the chassis frame is 31 in. wide in front and 34 in. wide in the rear, with a sub frame which carries the motor and the sliding gear speed change.

The sliding gear is Brown-Lipe, three forward speeds and one reverse, the change gear housing being fixed to the motor flywheel casing in unit assembly.

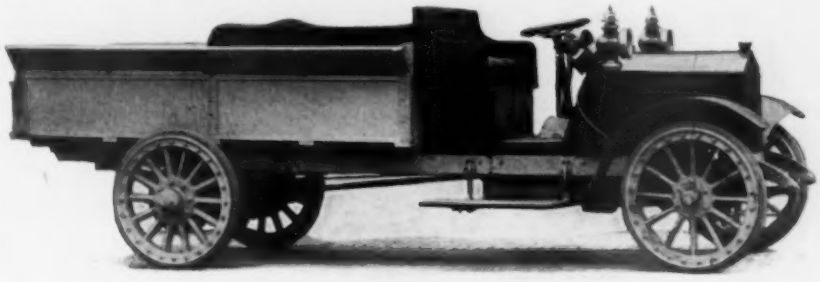
The rear wheel brake drums are 16 in. diameter and 2½ in. face, with internal and external brake shoes, Raybestos faced. The internal brake shoes are pedal applied; the external brake bands are applied by the driver's right hand, through a latched lever; the brake rockers are linked to full length equalizers, extending across the chassis frame, equalizing the brake effect.

The motor is the "Continental type C," 4 in. diameter and 5¼ in. stroke. The magneto is an Eisemann with fixed spark advance of 15 degrees. This motor develops 25 brake h.p. at 1000 r.p.m. The Kramer butterfly governor is fitted to limit the maximum motor speed. A Stromberg Carburetor is used.

The Driver's Seat and Dash

The designers of this American Truck have given close attention to the requirements of the driver's seat and convenience and durability of the control elements. Due regard for the driver's bodily comfort demands a well upholstered seat, with a comfortable lazy back, and ample seat width for two persons, which requirements are well provided for.

To ensure permanence, the designers have originated a novel sheet steel construction, using stock from 12 to 18 gage according to strength requirements, cutting and bending the steel sheet stock to dimensions and shapes needed, and then "spot" electric welding the entire seat, sides and front board into one integral steel structure, which is fixed to the chassis frame.

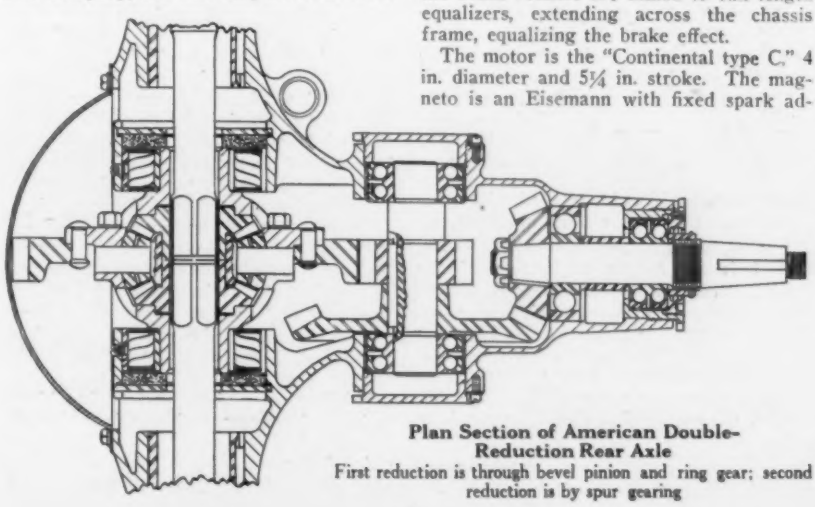


American Ton and a Half Truck
Continental 25 h.p. motor; three-speed transmission; full-floating rear axle; 132 in. wheelbase. $1650 without body

Control

The steering is by a 20 in. diameter hand wheel and the "Gemmer" worm and worm wheel steering gear, the worm and gear being of hardened steel. The throttle control lever, ratchet retained, is placed on top of the hand wheel. The drive is left side, with center control, having a speed change hand lever and a latched emergency brake hand lever operating through a full length evener to apply the external brake bands to the brake drums.

The first American truck has been on the road, under constant test, since August 1st, 1913. The tests are made under full load, and the truck is fitted with a taximeter recorder, a ribbon record being removed at the end of each day's work and filed for record. The only change resulting from this systematic and long continued full load test has been the addition of one more leaf in the rear springs. In every other particular the performance of this first American Truck model has been wholly satisfactory; the construction of the first lot of American Trucks is now well advanced, and it is expected that deliveries will begin not later than March 1st, 1914.



Plan Section of American Double-Reduction Rear Axle
First reduction is through bevel pinion and ring gear; second reduction is by spur gearing

Skilful Driving Reduces Skidding

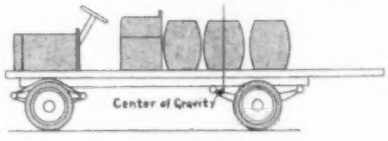
By MURRAY FAHNESTOCK

SKIDDING is an ever present menace when the streets are slippery with rain or ice. But constant vigilance, on the part of the driver, can do much to avoid danger from this source. The motor truck is far less apt to skid than a pleasure car, because it travels at a much lower speed, and speed not only increases the tendency to skid, but it also increases the amount of the damage when a skid occurs.

In few cases is the value of prevention over cure more forcibly illustrated than in the case of skidding, so it may be well to consider the causes of skidding, with a view of avoiding them. There are several features of truck design which increase skidding tendencies. A long over hang at the rear, by increasing the leverage of the load over the point of support, as represented by the contact of the rear wheels with the ground, is one cause. But if drivers are taught to place the heaviest part of the load well forward and next to the driver's seat, the center of gravity will be moved forward and the tendency towards swinging and skidding will be reduced. In the same manner, a truck having a long wheelbase has less tendency to skid, as the greater distance between the wheels increases the effective length of the leverage of the contact of the wheels and the ground. A high center of gravity, due to a bulky load seems to increase the liability to skids, and this is probably due to the rolling motion set up by the load and which sometimes starts a side-slip. When the center of gravity of the load is high, the springs cannot check the rolling motion as effectively as when the load is lower. Intelligent placing of the load on the truck, is then the first step in reducing the tendency to skidding.

The most common cause of side-slip and skidding is a slippery road surface, which may be due to ice in winter or rain in summer. In the spring the roads are unusually muddy and the melting snows make skids more frequent than at any other time of the year. Tire chains and other forms of metallic non-skids are effective but are more or less injurious to the tires and so should only be used when necessary. But they should be carried in the truck at all times because when they are needed at all, they are apt to be needed badly. Ropes are sometimes wound around the tires to secure traction, in an emergency, and they are fairly effective in snow, until they become covered with ice. Snow is comparatively easy to drive through and does not cause many skids. But if there is ice beneath the snow, then look out for skids.

A slippery road surface is often found on oiled or greasy roads and also when the roads are wet. The first shower makes the streets most slippery, for then a slippery scum is formed, which is washed away after it has been raining for some time. A slight thaw, after a frost, makes the roads very slippery and requires special care. In summer, light dust or loose gravel will sometimes start a skid but this seldom happens unless the steering is nervous or the truck is travelling at an excessive speed. On curves and turns, the inertia of the truck and the centrifugal force may start skidding, but these forces are directly proportional to the speed and, if the speed is

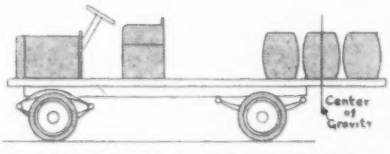


Proper Loading of Truck to Prevent Skidding

sufficiently reduced, all danger from this source will be avoided.

The camber, or crown of the road, may exert a slight tendency for the truck to slide into the ditch, if driven too near the edge, so it is better to keep nearer the center of the road, if there is not too much other traffic.

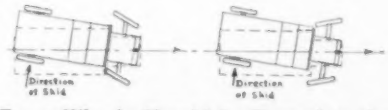
Car tracks are apt to be very slippery, when wet, especially if they project above



Load Too Far to Rear Causes Skidding

the surface of the road, and they should be crossed as nearly at right angles as possible. Even chains on the tires are of but little value, when turning out of car tracks, and the driver should be on the alert for a sudden swerve, when the rear wheels are about to cross the rails.

But slow speed nullifies nearly all of the above elements, and it is possible to drive safely enough over wet and slippery streets, if the speed is sufficiently reduced. Slow speed also reduces the use of the brakes,



Front Wheels Should be Turned to the Direction the Rear Wheels are Sliding

and it is the sudden application of the brakes, thus locking the rear wheels and causing the rear wheels to slide with equal facility in any direction, that is the cause of many skids. The uneven application of the brakes, to the two rear wheels, also has a tendency to cause skids. For this reason, the rear brakes should be carefully adjusted in the garage, so that both wheels will be equally retarded, when the brakes are applied.

When a stretch of slippery road surface is seen ahead, the driver should reduce the speed of the truck, disengage the clutch, and allow the truck to coast across, without applying the brakes or making any sudden turns. Drive gingerly over slippery places.

Bearing in mind that it is change in direction or velocity that is the most prolific source of skids; it is evident that the motor should be adjusted to run evenly and smoothly, particularly at low speeds. The worse the weather, the better the motor should be adjusted to run. In like manner, the clutch should be adjusted to better engage smoothly, and the brakes not to seize or take hold too suddenly as abrupt changes in velocity are to be avoided. Progress should be steady, not in jerks.

When approaching another vehicle, the driver should not wait until the last moment before turning out, as the sudden swerve may cause a skid and a collision. It is well to slow down, if the road is narrow.

When turning a slippery corner to the right, it is sometimes possible to keep near the corner and thus take advantage of the road camber, which acts as a banking, but when turning off the road to the left, this camber acts in the wrong direction, and so the driver should proceed more slowly. If, when turning to the right, the rear wheels evince a tendency to skid, in spite of the camber, the tires can sometimes be made to bite through the slippery part of the road surface, by letting in the clutch momentarily.

As a general rule, when the rear wheels begin to slide, leave the clutch in but slow down the motor. Apply the brakes very gently, if at all. In the case of any skid, it is essential to keep the wheels turning, if control of the truck is to be regained, and they should be kept turning in the direction in which the truck is moving. It is also well to turn the front wheels in the direction in which the rear wheels are slipping. If they are turned in the opposite direction, the front wheels will oppose the motion of the truck and act as a pivot, around which the rear wheels will skid. If the front wheels should skid, turn them as if for backing the truck. That is, if they skid to the right, turn them to the left. There is also the possibility, in the case of front wheel skids, of applying the brakes hard on the rear wheels, thus causing the rear wheels to skid also, and by utilizing the same forces that caused the front wheels to skid, the rear wheels will be made to skid in the same direction. This is a possible means of correcting a front wheel skid. Fortunately, front wheel skids are rather rare, although they are sometimes caused by one of the front wheels striking an obstruction, which swings them to one side.

Skidding is very hard on tires, in addition to being dangerous, and even in racing, the intentional skid is rarely used. However a brief consideration of the methods of causing a skid, may show the best methods

for its prevention. To skid around a corner, the brakes must be applied sharply, and the front wheels turned suddenly, thus causing the truck to make a sudden swerve. This throws the rear wheels and the back of the truck around with a snap-the-whip action, which causes the rear wheels to slide. The farther to the rear the weight is carried, the greater the momentum of the swinging mass will naturally be. Thus the use of the brakes on the corners should be avoided as much as possible.

Summary of Non-Skid Rules

1. Load carefully, keeping center of gravity well forward.
2. Avoid excessive speed in slippery places.
3. Drive as straight as possible and avoid abrupt turns.
4. Use the brakes gently and engage the clutch smoothly.
5. Keep on the level part of the road.
6. Cross car tracks as nearly at right angles as possible.

CARE OF TRUCK SPRINGS*

Springs are probably called upon to stand more punishment than any other part of a truck. The variation from no load to full load is so much greater, than on a pleasure vehicle, that it is worthy of attention. Assume a three-ton truck to weigh 8000 lbs. or 4 tons, above the springs. When loaded a strain of 7 tons is upon the springs against 4 tons empty, a gain of 75 per cent. A pleasure vehicle weighing 2 tons is only asked to take an additional passenger weight of 1200 lbs. or a gain of 30 per cent. These figures indicate that the truck springs must handle close to two and one-half times the variation of a seven-passenger pleasure vehicle.

The next item is the solid tire of the truck that throws additional vibration upon the springs. The frame of a truck is far more rigid than that of a passenger vehicle, which throws the distortion, due to road vibration, upon the springs of the truck.

Spring Efficiency Depends on Load Distribution

Next, and of great importance, is the distribution of load. In a pleasure vehicle the position of the carried load is predetermined, but on a truck the placing of the load is entirely up to the discretion of the driver.

The relation between bulk and weight of goods transported is widely variable, sometimes even in one load. The necessity of evenly distributing such a load in proportion to weight instead of volume is a point that must be observed.

Quite often there is a temptation to place a heavy casting or piece of machinery on the very rear of the platform. A little thought and analysis will show that such loading throws a complex set of strains upon the springs that cannot help but be harmful. Such a load should be placed in the middle of the platform right and left and as well as possible fore and aft.

Front Springs Have Easy Work

The front end of a conventional truck has a more or less constant load. At all events, 80 per cent. of the load falls on the rear springs. It follows that the variable loading at the front end cannot be greater than the ratio of the load, reduced to lbs., to the weight of the motor equipment, cab, driver and helper.

Referring to the rear springs, since they carry 80 per cent. of the total load and, remembering that the load varies from nothing to as much as 50 per cent. overload, nothing but the intelligence of the driver stands between good and bad spring service.

Speeding Unhealthy for Springs

Speeding is probably the greatest crime that can be perpetrated upon an innocent truck. If a truck is moved along the road at 10 m.p.h. under full load, it is more than likely that it will continue to do so for a very long time without exhibiting undue weakness at any point. But, if a truck is driven without any load at 20 m.p.h., remembering that the truck weighs more or less than 60 per cent. of the gross rated load, it is a certainty that that truck will wear out long before it pays for itself in service. It is not believed that the average driver fully understands how detrimental it is to the life of a truck to drive it at high speed when it is empty. The energy stored in a moving mass responds to the rule, which may for convenience be expressed as follows:

The energy stored in a moving mass is proportional to the weight in lbs. multiplied by the square of the speed. In other words, if the speed is doubled, the strain is multiplied four times, and the life of all parts materially diminished.

Spring Clips Should be Tight

Spring clips should be inspected at least once a week and tightened as much as possible. If the clips become loose, the spring will break between the clips. If there is undue stretching of the clips, the difficulty might be overcome by having new clips made of better material, as it is always cheaper to replace clips which are too light than to have broken springs as a result.

The bearing place upon which the spring rests on the axle should absolutely conform to the curvature of the spring at that point, for sufficient bearing surface is just as important as tight spring clips.

Don't Employ Blacksmith Repairs

If a spring plate should break, it is important to have it repaired or replaced immediately by a skilled spring maker. Quite often a break in a plate occurs at a place where it does not immediately cripple the entire spring, but it is simple to understand that the breaking of one plate throws extra work upon the other plates which will break in turn. If one of the intermediate plates should break at the center bolt, the spring clips should be tightened down until it is possible to have the break repaired.

On chain drive trucks there is always an ample allowance for adjustment to offset the stretch and wear of the chains. As the chains become stretched to a great extent, it is wise to remove an entire link and then shorten the adjustments so as to keep the spring shackles (at each end of the spring) standing at about the same angle.

A spring is a complete unit as produced by the spring maker. The removal or addition of a plate entirely disarranges the grading of the original plates, and should never be practiced under any circumstances. It is also very bad policy to replace a broken plate by any plate that happens to be of the same width as the spring. It is far more desirable to let a competent spring maker attend to the repair or replacement.

In view of the preceding, there follows a list of things to be observed in the operation and care of the truck, if there is a desire to give the springs a fair chance to offer their longest life.

Rules of Reason

Evenly distribute and prevent shifting of load.

Do not overload beyond rated capacity. The factor of safety allowed by the maker is for the owner's protection as well as the maker's.

A wheel out of round due to flat spots on a solid tire, imposes a severe and danger us shock upon the springs. Keep the wheels round.

Keep excessive side play out of shackles and hangers to minimize the lateral shock on the springs when on rough roads.

Give careful attention to all parts subject to friction. Keep them amply lubricated, as an excess of grease keeps the dirt out.

Take corners slowly, with or without load.

Back into a curbstone or platform gently, as your radius rods might buckle and throw the jolt upon the springs.

In driving the front wheels against a curb, or any obstruction, the shock must be taken by the springs alone.

When loaded, drive gently over rough road or obstruction, remembering your frame is rigid and the springs must take the distortion.

Drive at moderate speeds at all times. Remember your solid tires have little resiliency.

If you have to tow a car, or have your car towed, hitch the tow-rope to the frame—not to the axle.

If an accident occurs, and a spring hanger, or the frame near the hanger is bent, have it straightened at once.

A spring distorted by a bent hanger is liable to break under load.

When adjusting chains, remove a link when the adjustment would throw the shackles to a bad angle.

Keep spring clips tight at all times.

If a center bolt should break due to loose clips, replace it at once.

On a crowned road, drive as nearly in the center as possible, as driving to the right throws an extra load on the right side springs.

If a plate breaks, have it repaired by a competent spring maker at once, or the other plates will break in turn.

Tighten or replace loose or broken rebound clips.

Keep sober, as an intoxicated driver breaks more springs, than do rough roads

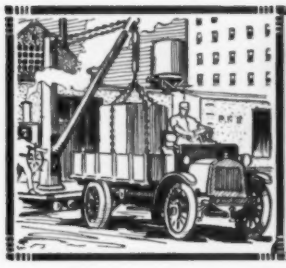
WHITE ROADSTER FOR CIGAR SALESMEN

The increasing adoption of utility cars for the use of salesmen and others who must cover a large territory is emphasized in the purchase of five White roadsters by the firm of Waitt & Bond, of Boston. This company manufactures several well-known brands of cigars, and it is the intention of the firm to have the salesmen cover their territories with these roadsters. Each of the new roadsters is built with a special trunk to contain samples of the different brands and sizes of cigars.

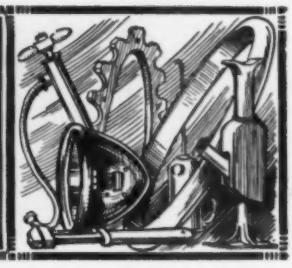
Truck Aid to Education

California uses trucks to bring the pupils to the high school, takes them to lunch and returns them home after school. The trucks are Manufactured by the Pacific Metal Products Company, Torrance, Cal., which uses Continental motors.

* From booklet published by Perfection Spring Company, Cleveland, Ohio.



TRUCK ACCESSORIES AND APPLIANCES



MATHIESON SPRING-CUSHION WHEEL

The Mathieson Spring Wheel Company, 2332 Michigan Avenue, Chicago, is calling the attention of motor truck builders and users to its new spring cushion wheel which is claimed to give riding qualities equal to a pneumatic tired wheel upon all kinds of roads. This wheel is also claimed to add life to the battery of an electric, to prevent spring crystallization and to reduce the upkeep of the car 50 per cent., due to the shock absorbing qualities of the wheel. It is a complete wheel consisting of double spiral springs, resting in the spokes of a floating axle, which takes the form of multiple shock absorbers. The construction permits the wheels to be tired with a solid tire. The springs are embedded in heavy grease, making the riding qualities positively noiseless.

The hub, in turn, is completely covered by a plate, which keeps the wheel free from all dirt or rust. With this protection it is impossible for any of the mechanical parts to become disarranged or abused, through heavy service.

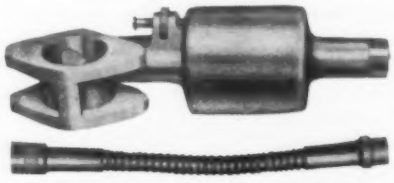
The illustration herewith shows the construction of the wheel without the hub plate. The position of the four rockers are shown under heavy stress, compressing the spiral springs embedded in heavy grease in the spokes.

PIERCE SPEED CONTROLLER

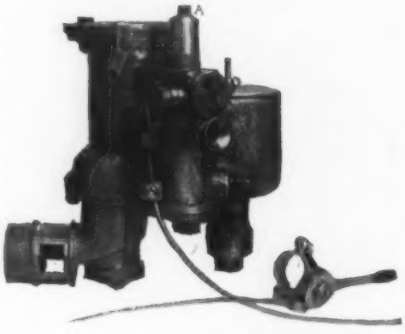
The Pierce Speed Controller Company, Anderson, Ind., has just marketed Model T, Pierce Speed Controller, which controls the speed of the car by shutting off the gasoline automatically at any predetermined point.

This instrument is attached to the intake manifold between the carburetor and engine and is operated by the speedometer; it can be set so as to shut off the gas whenever the car goes above any speed at which it is desired to place the limit, slowing the engine immediately, when it again automatically gives it gas.

In the Model "T" the controller case and valve box are made of aluminum and the variable dial head is placed in plain view under the hood, the driving gears and knuckle mountings are sealed in such a way that the driver cannot alter them without breaking the seals and removing the front wheel—may be either locked closed or open. The price of Model "T" is $40.



Pierce Speed Controller, Model T



The White Carburetor

Uses kerosene, gasolene or a mixture. Can be adjusted from dash through cable shown

WHITE BROTHERS COMBINE KEROSENE AND GASOLINE CARBURETOR

White Brothers Company, Mansfield, Ohio, has brought out a carburetor which will use kerosene, gasoline or a mixture This carburetor is of original design and novel construction and has been thoroughly tested. It is the usual size and can be attached to the manifold without changes in the engine. In using this carburetor it is necessary to prime with gasoline to start the motor, this being acomplished by having a small gasoline tank attached to the priming valve located on dash within reach of operator, which in turn primes the carburetor by allowing gasoline to flow through the hollow needle valve located under the small dome A.

The float chamber contains kerosene at all times; no valves are necessary to turn on or off, and no gasoline enters the float chamber. A main and auxiliary valve are used. The auxiliary valve has a dash pot. The needle valve is connected to the auxiliary valve to raise and lower it and admit more fuel when more air is introduced. The needle valve can be adjusted slightly by the flexible shaft from the driver's seat to give a richer mixture in starting. The valve just back of dome A is a water valve connected to the auxiliary valve to feed water with the mixture.

After the motor has been started on gasoline the gas primer is turned off, and the carburetor automatically picks up on kerosene. Feeding water with the fuel in either case is claimed by the manufacturer to give greater mileage. This carburetor is furnished in all sizes to fit standard manifolds.

CAST-STEEL TRUCK WHEEL

Buchanan Electric Steel Company, of Buchanan, Mich., manufacturers of electric furnace steel castings, is manufacturing a cast-steel wheel for trucks. This is a one-piece casting of disc type, with a hollow box rim, suitable for S. A. E. demountable tire. Side flange can be held in place by bolts passing through this box-rim structure. A large brake drum is cast integral with the wheel while the hub is also cast integral with the wheel, and is complete, according to customers' specifications. On large capacity trucks, it is claimed these wheels weigh less than the wood wheels for the same work; on the small sizes they are about the same. Prices depend entirely upon specifications. The company also casts for heavier work, wheels with double discs, all cast integral with the rim.

Mathieson Spring-Cushion Wheel

Buchanan Cast-Steel Truck Wheel

THE IDEAL PRIMING CUP

This is a radical departure from the priming cups now on the market, and is designed on a needle valve principle. The needle valve is heavy, and the handle of non-burning fibre. This cup is claimed by the manufacturers to be non-leaking under the highest compressions. It is especially valuable in testing a cylinder to see if it is firing or not. It can be operated by the thumb and finger without any tools, and there is no danger of burning the hands, as the fibre does not heat, and is thoroughly insulated. It is manufactured by the Ideal Brass Works, Indianapolis, Ind., and sells at 25 cents each.

DUELEC VAPORIZING PRIMERS

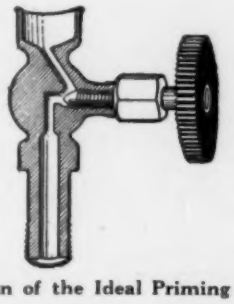
This device, to take gasoline from the supply line, vaporize it by electricity and deliver it in the intake manifold in a condition favorable for an explosion and thus make starting easy, is furnished in two styles; one in which the gasoline valve is opened by a solenoid action, when the switch is turned on. It sells at $10.

Number two consists of a heating porcelain or fibre, within which is a heating coil, held in place by two binding posts, to which are attached wiring from the battery or other source of supply, and the switch, push button, or other means of control. Below the heating chamber is the gasoline valve, which has a connection to the fuel line by means of copper tubing. The top of the heating chamber is connected to the intake pipe above the carburetor.

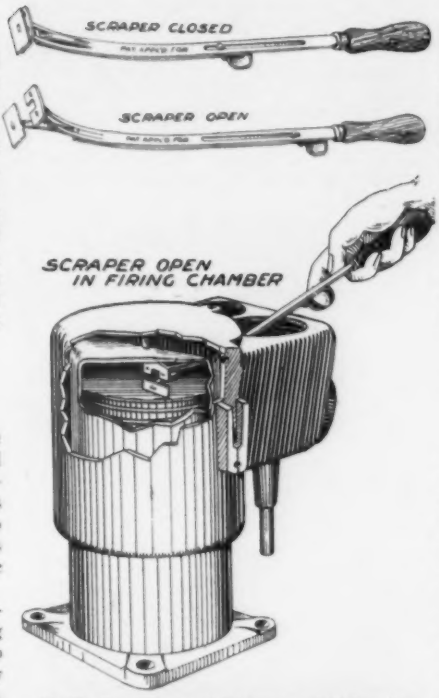
When the valve is turned on, it turns the current through the heating coil, and also permits the gasoline or other fuel to enter the heating chamber, where it is thoroughly vaporized and passed into the intake manifold whence it enters the cylinders and is easily exploded. When the switch is turned off, the priming current and the fuel from the regular line are shut off. The device sells at $5.

VAIL'S CARBON SCRAPER

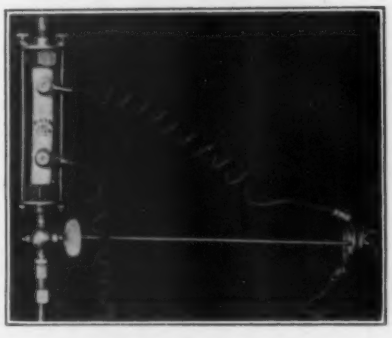
Vail's carbon scraper is a tool for removing carbon deposit from automobile cylinders. This scraper was designed for and works successfully in any "T" or "L" head motor by simply removing valve caps and turning motor until piston comes to top center. Scraper is then inserted (closed) through either valve port, and by pulling back expanding bar, scraper will open to conform to size of firing chamber. Moving scraper vigorously backward, forward and around side wall for a few minutes loosens all carbon deposits.



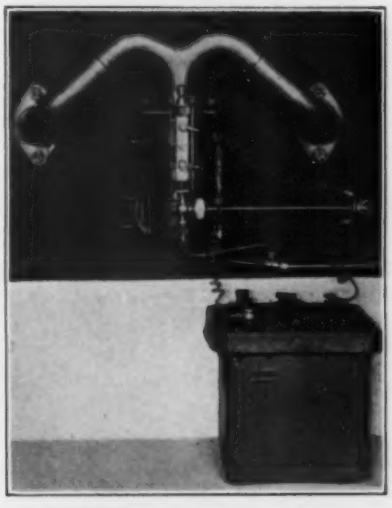
Section of the Ideal Priming Cup



Vail's Scraper and Manner of Using It



Duelec No. 2 Vaporizing Primer
Showing the heating chamber and the gasoline valve below



Duelec No. 2 Vaporizing Primer, Attached

When this has been done all carbon should be scraped into valve chamber with closed scraper, and either spooned out with closed scraper or blown out with air from foot or pressure pump; then, a soft cloth saturated with kerosene should be placed between the blades of scraper (making a mop), reinserted into cylinder, will remove any fine particles of carbon which might be left.

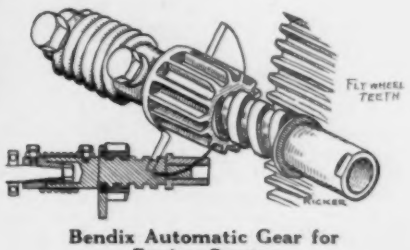
The device is made of the best spring steel with hardened blades. Handle is wood with heavy steel ferrule. It is manufactured by the Steele & Collins Company, California Building, Los Angeles, Cal.

THE BENDIX AUTOMATIC GEAR FOR ENGINE STARTERS

The Brandenburg Company, Chicago, Detroit and New York, have just placed upon the market a novel device to be used in connection with engine starters, the same being made by the Eclipse Machine Company, of Elmira, N. Y. The device consists of the mechanism between the starting motor and the geared flywheel of the engine. On the starting motor shaft is a thread upon which runs a nut, the periphery of which forms a small spur pinion which is to mesh with the geared rim of the flywheel. When the starting button is depressed, the armature of the starting motor speeds up, its first action being to screw forward into mesh with the flywheel the pinion just mentioned. The pinion is prevented from rotating with the shaft by means of a half collar or flange which acts as a weight and by gravity prevents it from turning with the shaft. It, therefore, is screwed along the shaft until it makes engagement with the flywheel. It has no driving effect until after the pinion is fully enmeshed, at which time the armature is already in motion and generating a considerable amount of counter E. M. F., making possible the use of a somewhat smaller motor than would ordinarily be used with a single reduction gear. The instant the engine starts, the greater speed which it imparts to the small starting pinion, instantly screws it backward out of engagement with the geared flywheel rim, this action being entirely automatic.

It is impossible to mesh the starting pinion with the engine flywheel if the latter is in motion; the gear simply runs up to the flywheel, strikes once and rotates freely with the starting motor shaft out of contact with the flywheel gear.

A feature which cannot be overlooked in connection with this device is the fact that it accomplishes the same work at about one-fourth of the usual cost of such devices, it being sold in quantities to manufacturers at approximately $6.



Bendix Automatic Gear for Engine Starter

CAM JACK FOR TRUCKS

Four-Wheel Auto Jack Company, 146 Madison Avenue, Reading, Pa., has brought out a cam jack for trucks up to 6000 lbs. It has a malleable iron frame slide and lever, and a handle of cold drawn pressed steel and seamless tubing. The handle has a working length of 36 in. and telescopes to 18 in. for packing. The long handle permits placing the jack under the machine without soiling clothing and a single push

Model B Cam Jack

gives a lift of 2 in. The top is 11½ in. high and lifts to 18 in.; the side arm is 7½ in. high and lifts to 14 in. The device weighs 9 lbs.

It operates through a cam. Minimum of parts and absence of reversing mechanism makes it simple, quick and strong. It can be instantly adjusted to required heights. By throwing back pawl and stepping on handle, the slide will make a quick drop, releasing car instantly. An automatic stop firmly locks the lever at the end of lift, making use of pawl only necessary when "stepping up" by two or more lifts. A steel roller eliminates friction. After inserting the handle in the lever, a half twist to the right fastens it tightly. It sells at $4.

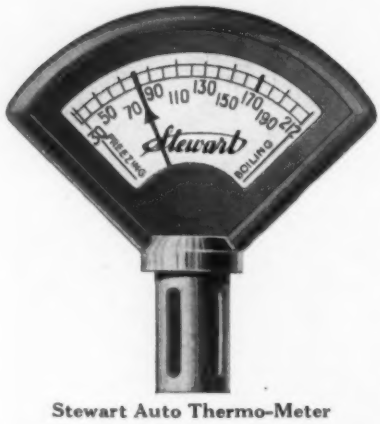
FEDERAL GASOLINE TANKS

With the present-day intensified service that truck users expect from their machines it is imperative that not only the power producing and transmitting elements of the vehicle be given the most careful attention on the part of designers, but that also due consideration be given to the non-moving or inactive parts of the machine. As an example of the attention given to the manufacture of such parts, the Federal Pressed Steel Company, of Milwaukee, Wis., proffers its line of seamless steel gasoline tanks which are made by the cold drawn seamless process. The operation consists of taking a disc of steel and by a series of drawing operations, drawing the same out until it measures 50 in. in length. Between each operation the shell is annealed. From the accompanying drawing it will be noticed that the tank is a seamless shell; the head being put in under about 1000 lbs.' pressure and the end of the shell is crimped or spun over. This leaves the difference between the gauge of the bottom, which is No. 10 and the gauge of the walls, which is No. 16. This joint is then filled and wiped and finished in such a way that the ordinary layman cannot tell one end from the other.

Each tank is tested to 50 lbs.' pressure before leaving the factory, which is of course, more than necessary where used for gasoline. All tanks are thoroughly coated inside and out with a mixture of tin and lead, which takes care of rust and gives the tanks a fine body for painting operation. The illustration shows several types of fillers, and the openings and sediment cups can be made to customers requirements.

STEWART AUTO THERMO-METER

This device, to be attached to either hinged or screw radiator caps, and indicate the water temperature and the motor's operation, is the latest product of the Stewart Warner Speedometer Corporation, 1826 Diversey Boulevard, Chicago, Ill. As motor-



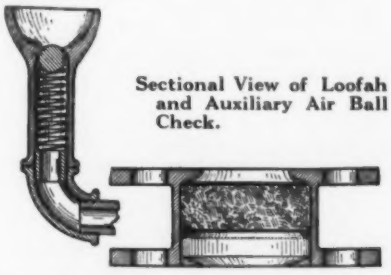
Stewart Auto Thermo-Meter

ists know, the motor's operation influences the temperature of the cooling water, such as water steaming when oil circulation is not operating, or there is a lack of water, etc.

The device contains a thermostat bar below the top of the radiator cap, so that the dial's registering is not affected by the outside temperature, but by the water's temperature only. As the bar is warped either way by the heat, it actuates a pointer, 2 in. long, and causes it to move across the 3-in. dial. The large figures and the pointer's prominence make it possible to see the position at night, etc., when the figures themselves cannot be distinguished. In either brass or nickel, the device lists at $10.

BURLEIGH'S LOOFAH-PRIMER AND FUEL ECONOMIZER

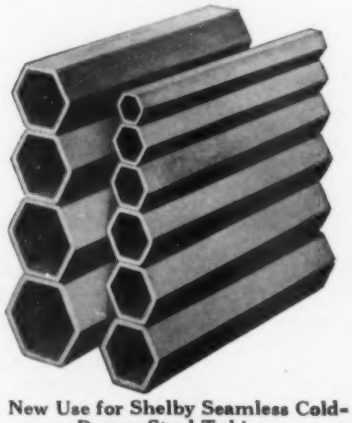
As the name indicates, this device is designed to make starting easier and to give more mileage per gallon of fuel. It is manufactured by George K. Burleigh, Penacook, N. H.



Sectional View of Loofah and Auxiliary Air Ball Check.

Loofah goes between carburetor and manifold pipe, taking 1 in. space. It is also made to fit 1¼-in. and 1½-in. carburetors. When the right amount of gasoline goes through Loofah a dry gas mixture is had in cylinders; the needle valve is turned off one-eighth or one-quarter turn less and throttling is claimed to be much easier. Gasoline is broken up in passing through, by the air entering at right angles, and by the very fine screen.

When a cold motor is to be started, the cup is filled with gasoline and let into Loofah by depressing the ball check. Then the cup is filled again. When the engine starts, it draws in the gasoline which was in the cup. The device sell at $5.



New Use for Shelby Seamless Cold-Drawn Steel Tubing

The National Tube Company, of Pittsburgh, Pa., is putting its seamless drawn-steel tubing to a new use, namely, that of drawing it into hexagonal shape to be used for wrenches. The above illustration shows the tubing in a number of sizes.

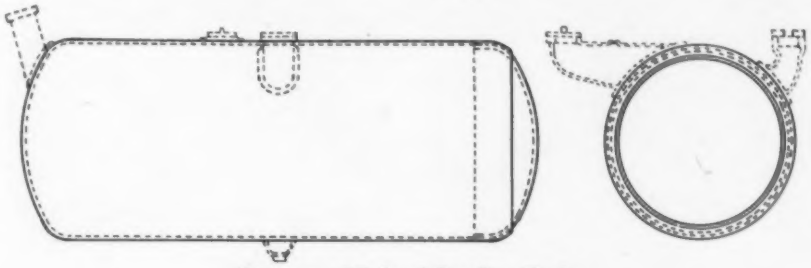


Diagram of Federal Gasoline Tank
Showing also various styles of filler openings

A NEW GOVERNOR FOR MOTOR VEHICLE CONTROL

The requirements of an efficient motor vehicle governor, according to the Duplex Engine Governor Company, Inc., 80 Maiden Lane Building, New York City, are that it accomplish at least five things; first it should provide a positive control of the maximum speed of the motor, at all times, whether running idle or under load; second, it should permit of different maximum motor speeds for the different gears and it should confine those speeds, so far as possible, considering the power requirements for the different gears, to within that zone of motor speeds corresponding to the highest motor efficiency; third, it should do this through a mechanism capable of simple and accurate adjustment whereby the maximum speed of the motor, and the maximum speed of the vehicle, may be raised or lowered at will to suit the varying conditions of service for which the vehicle has been designed, or provided; fourth, it should provide a valve mechanism, free from fluttering tendencies; which will effectively and economically feed the gas mixture to the motor only in such amounts as may be needed to develop and to maintain the desired power, and no more; and, fifth, all of these functions should be included in a mechanism of such simple design and substantial construction as to be fool-proof and tamper-proof, and capable of being locked, or sealed.

The most recent design evolved along these lines is found in the construction of The Duplex Governor, which is now undergoing some severe trials by several of the large commercial car manufactures, and the reports concerning which are said to be very satisfactory.

This governor was designed on the principle of a dual actuating influence. This double influence consists of a motor influence, as to its speed, which is imparted to the governor, and a vehicle influence, as to its speed, which is also imparted to the governor. The motor speed may be conveyed from the timing gears, magneto shaft, etc., and the vehicle speed from the propellor shaft, or jack shaft. The conveying speed means consists of a ¼-in., sixteen-strand, steel cable revolving in a hard fibre, or metallic casing. The centrifugal member, valve member, and adjusting member are all consolidated into a single unit within an inclosing shell which is interposed between the carburetor and the intake manifold of the motor, as shown in illustration Fig. 1 in such a manner that the entire gas supply must pass through the valve. On each side of the valve chamber provision is made for the insertion of a speed terminal, one conveying to the governor a proportionate vehicle speed, and the other conveying a proportionate motor speed. Within the governor there are two automatically acting one-way clutches, the floating members of which consist of gears in mesh with a third gear mounted on the centrifugal governor spindle. These clutches are so designed as to impart to the centrifugal member that of the two speeds which is the higher. With the motor running idle the motor speed will actuate the governor, and the motor is always under governor control. When the vehicle is in motion, and is being propelled by the motor on high gears, the speed imparted to the governor by the vehicle will be the higher speed and will govern the motor, whereas on low gears the motor speed will be the higher and will govern the motor. The governing valve employed is a grid valve of special construction and is said to be entirely new in the industry. It consists of a fixed part set into the upper part of the valve chamber and provided with elongated slots having flaring walls from its under surface outward, as shown in illustration Fig. 2. Below this fixed part, a movable part provided with a corresponding series of slots having flaring walls from its upper surface downward, has an arc movement along the line of the minor axes of the slots, or across them, and is supported by means of a substantial bearing. The maximum travel of this movable part is less than ⅛ in. and in that small travel effects all degrees of aperture between full open and full closed valve. When the openings of the rigid part coincide with the openings of the movable part the valve is open, and when the bars of the rigid part cover the openings of the movable part, and vice versa, the valve is closed. The two parts of the valve have a ground fit. The movable part is held in open position by means of spring pressure, and its possible motion, in both directions, is limited by suitable adjusting screws. These details are fully shown in the illustration Fig. 3.

The influence of the centrifugal member, as a result of the speeds imparted to it, is to develop a pressure sufficient to overcome the spring pressure tending to hold the valve in its open position, and to close the valve. As soon as this pressure is removed the movable valve part is released, and returns to its full open position. The adjustment factor is constant for all speeds. The increase of the centrifugal pressure,

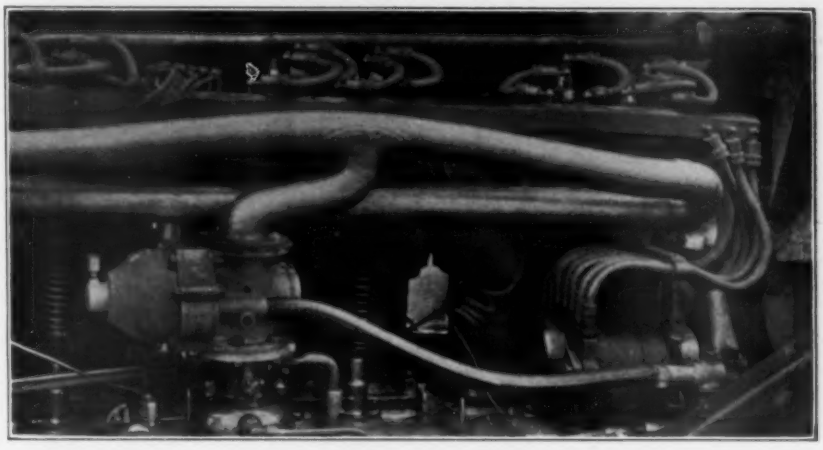


Fig. 1. The Duplex Governor
Showing the same interposed between the carburetor and the intake manifold of the motor

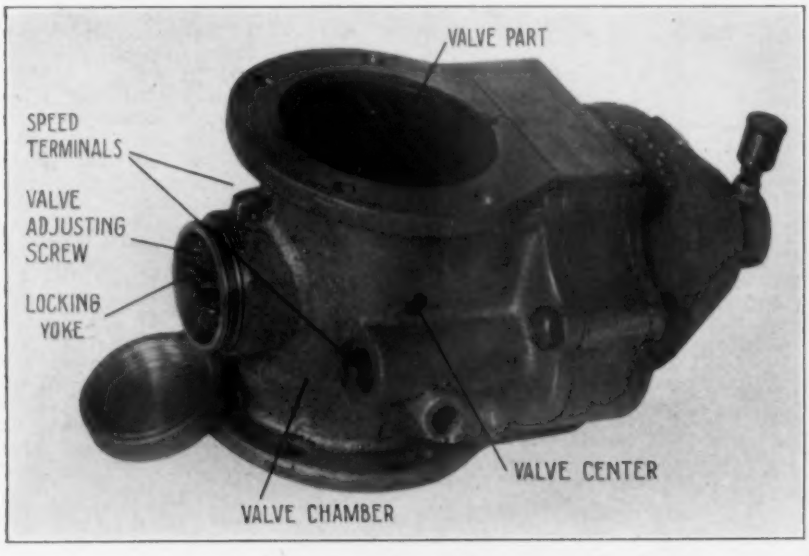


Fig. 2. The Duplex Governor
Note the grid-shaped valve

as the square of the speed increases, is balanced by a spring pressure tending to return the centrifugal weights to their negative position, plus the spring pressure of the movable valve part. The working combination between the centrifugal member and movable valve part is influenced by the adjusting screw as shown. The locking yoke may be removed and the hand-wheel turned to the right, in which case the possible vehicle and motor speeds are reduced, and if turned to the left, they are increased. This results from the lengthening, or shortening, of the valve stem, and thus increasing or decreasing the required travel of a floating collar, carried by the centrifugal member, to influence the position of the valve.

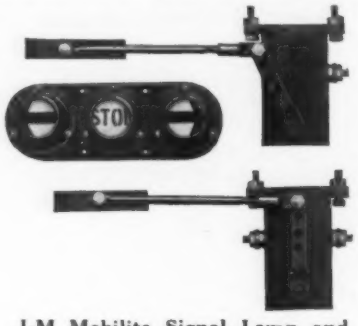
It is claimed that the construction of the valve and its actuating influence are such as to free it from all vibration; its moveable part is balanced, and its center of gravity lies within its center of support. The openings of the valve parts, when superimposed, are so designed as to constitute elongated venturi with a view to wire-pulling all of the gas passing through the valve, and for the further purpose, through the flare of the walls of the openings, to establish slight cross currents in the gas flow to promote the better commingling of its ingredients.

The centrifugal member revolves in a chamber entirely separated from the gas chamber, and in an oil bath. This chamber contains all of the moving parts of the unit, excepting the valve and yoke parts in the valve chamber, which have a maximum movement of less than one eighth of an inch. A screw cap is provided to cover the adjusting means which may be locked or sealed.

It is claimed by the inventor, as shown in actual practice that the maximum variation in speed, with throttle wide open, both on climbing and descending normal grades, within the power and compression limits of their respective motors, will not exceed a plus or minus 5 per cent. Where the vehicle speed is low, as in the case of a commercial car, it is recommended that the car be speeded to its desired maximum and then run on full throttle under governor control. It makes the driving of the car simpler and frees the driver from a great deal of nervous tension and strain which is very trying in a full day's operation. The motor is entirely freed from the evils of pedal control, no matter how great the vehicle vibration may be, and the gas is fed to the motor only when, and only in just such quantities as may be necessary to maintain the desired vehicle speed within the limitations of motor capacity, and no more. As a result of this reduction of piston travel, and the uniform feeding of the gas mixture, radiator temperatures are reduced and lubrication is simplified.

REAR SIGNAL FOR TRUCKS

This device, known as the J-M Mobilite Signal Lamp, and manufactured by the H. W. Johns-Manville Company, of New York City, is an electrically operated device and relieves the operator of the necessity of putting out hands to signal cars in back. The feature of this outfit is that it is self-contained and does not require any manipulation by the operator. It consists of three small electric lamps mounted on an aluminum base finished in ebony black, as shown in the illustration. When the steering wheel is turned to the right or left, a white arrow automatically appears in the corresponding lamp, indicating the direction in which the car will proceed. And when the clutch is thrown out, the word "stop" automatically appears in red in the center lamp. These signals are operated by self-contained, waterproof contact devices attached to the steering gear and clutch, respectively.



J-M Mobilite Signal Lamp and Operating Mechanism

Each lamp unit is made up of a vulcanized rubber socket fitted with a specially made Tungsten bulb and a powerful reflector. They consume only one-third the current needed for standard lighting equipment and therefore can be operated successfully on dry batteries.

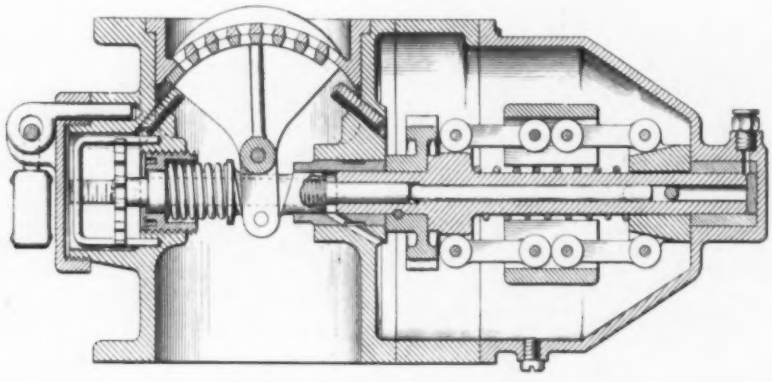


Fig. 3. The Duplex Governor

Diagram shows the automatically acting one-way clutches, also the operation of the grid valve

LIGHT BRONZE-BACK BEARINGS

The Light Manufacturing & Foundry Company, Pottstown, Pa., has recently marketed a patented bearing, the back of which is a heavy rolled phosphor-bronze plate of great tensile strength, which is perforated, countersunk and formed in proper shape in hardened and accurately ground steel dies.

This is then coated completely with a heavy coating of pure tin, after which it is placed in the casting die and heated to the melting point of the coating.

Babbitt metal to form the lining of the bearing is then forced into the die in a molten state, under heavy pressure, and by a special process fused in perfect cohesion with the bronze back, forming a lining of ample thickness to take care of all necessary wear.

The babbitt metal is forced through the perforations in the back, forming rivet-like heads in the countersunk perforations, thus locking the lining permanently to the back. Both the babbitt and phosphor-bronze are the Light Company's own standard production unless the customer prefers an alloy of his own, in which case it will be made up to meet specifications. These bearings will be furnished in any shape, flanged or unflanged or solid round bushings.

Gibson Automobile Company, Indianapolis, Ind., is offering a new accessory in the shape of a portable Acetylene-Oxygen Combined Welding and Carbon Removing Outfit. It solves a very important and troublesome problem of the repairman, blacksmith or other profession having welding work to perform. This equipment is carried in a regular hand case, weighing less than forty pounds it is used in connection with standard tanks of compressed oxygen and acetylene, requiring no generating plants. It also has a decarbonizing attachment, which is used in removing incrusted carbon from motor cylinders.

TRUCKS MORE CERTAIN

Fred. L. Kunkel, president of the Cream City Bedding Company, of Milwaukee, is an enthusiast on the subject of motor trucks. There are two Kissel Kar Trucks in the service of his company. "With truck service, I can easily carry out a delivery plan, whereas with horses, the carrying out of a plan was always uncertain," says Mr. Kunkel. Mr. Kunkel finds that his truck drivers are quite willing to start with a heavy load an hour before closing time in the afternoon, whereas it was difficult to get them to do so with horses without assuring them a bonus for overtime.

The Austrian Minister of War, in looking for a substitute for the rubber tire for motor trucks, has offered a prize of $10,000 for a suitable material or device. The new material must possess greater durability, or, with equal durability, must have a smaller first cost, besides having elasticity and adhesiveness. It must not exceed a rubber tire in weight.

The Quartermaster's Department of the State of Michigan has definitely discarded mule-drawn vehicles in favor of those motor driven.

TWENTY THOUSAND MILES ON WOOD BLOCK TIRES

CUTTING the mileage cost of motor trucking, the wood block tire has demonstrated its value in making profits for the truck owner. A Los Angeles manufacturer claims a fifteen to twenty thousand mile record for his wooden tires on dirt roads while from six to ten thousand miles on rock roads is the average. Of course the first cost is lower as wood is decidedly cheaper than rubber, while renewals are not so costly or frequent, as glass, nails and

Bacon Wooden Block Tire

sharp rocks have no injurious effect on the wood. The blocks are set with the grain to the road surface and quickly form a somewhat resilient mass of fibre, in which the dirt of the pavement becomes embedded, making a compound somewhat like hard rubber as far as resilience in concerned.

A number of 3½-ton trucks are thus equipped for heavy service in Los Angeles and the owners are enthusiastic in their praise as money-savers. For use in the mountains, for mining companies, lumber firms and road contractors they are especially useful.

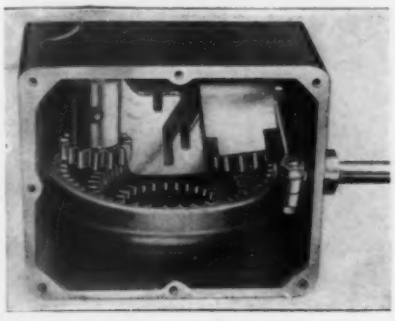
One Arizona mining company was about to abandon the use of its three five-ton trucks because of the excessive cost of rubber tire renewal on the flinty road surface, when the wood block tire was tried out and solved the problem perfectly.

The blocks are the product of the Bacon Wooden Block Tire Company, 121 E. 9th Street, Los Angeles, Cal.

THE FISCHER MAGIC INTERNAL-GEAR TRANSMISSION

This transmission, while somewhat radical in departure from the accepted standard selective type, has been proved by hard service over the hills of Switzerland to be reliable, quiet and highly efficient. It gives a selective type four-speed transmission. The manufacturers claim that greater efficiency is had by allowing more teeth to remain in contact, and that the internal gear construction permits of a more substantial tooth, there being no undercut below the pitch line, leaving the tooth considerably larger on the base line than with external gear drive construction. The angle of contact during the driving period will also deviate less from a straight line.

The main gear, consisting of a series of internal gears, is keyed to the main and only transmission shaft and is coupled on the rear end through a Cardan shaft, to the rear axle; a pinion shaft connected through a universal joint to the engine clutch and



Transmission Assembly of Fischer Magic Internal-Gear Transmission

Case open, showing driving pinion; fingers for directing pinion to speed selected; and reverse gear, which automatically meshes with first-speed gear.

through its other end carrying a pinion and an ingenious shifting device which permits the engagement of the four internal gears, one at a time, at the will of the operator. When on high gear, the drive is absolutely direct, the pinion simply sliding into the smallest internal gear, locking the driver and driven shaft positively and driving the same at engine speed. The first, second and third speeds are simply internal gears, having their teeth placed in line with the axis of the driving shaft and pinion when coupled up in their respective positions or speeds. This construction dispenses with jack shafts and a combination of sliding gears and shifting mechanism.

For the purpose of reversing or backing up the car, a pinion is interposed between the driving pinion and the main first speed gear, which is plainly shown in the cut. The pinion shaft is supported by a sliding block of liberal dimensions, rigidly supported so as to make any lateral or vertical movement impossible during the time the pinion is engaged in driving the internal gears. A spring operated lock prevents any accidental disengagements of the pinion from the gear and the force of this spring is also utilized to facilitate the prompt sliding into position of the gear pinion. This transmission is being placed on the market by the Fischer Motor Corporation, 30 Church Street, New York City.

FUEL SAVER FOR MOTOR TRUCKS

The illustration shows a new fuel saver and carbon preventer placed on the market by C. R. Baum, 1908 Wyandotte street, Kansas City, Mo. It consists of a fluid receptacle which has a coiled tube inside that is connected to exhaust, so a portion of the exhaust is concentrated to heat the fluid and air. The latter is permitted to enter intake manifold in varied amounts by a spring pressed foot or hand valve. As the speed increases it takes more hot, vaporized air or steam, and accelerates the speed and power of engine to a marked degree, breaking the molecules of gasoline into fine atomized spray that is more explosive. The fluid used is water, kerosene and other mixtures, including a special decarbonizing mixture. Should dry air be

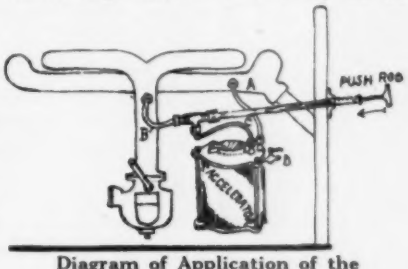
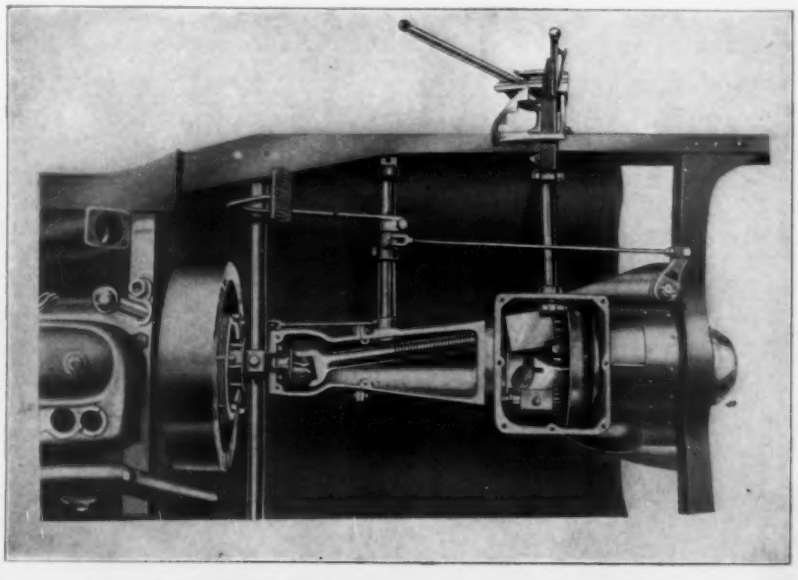
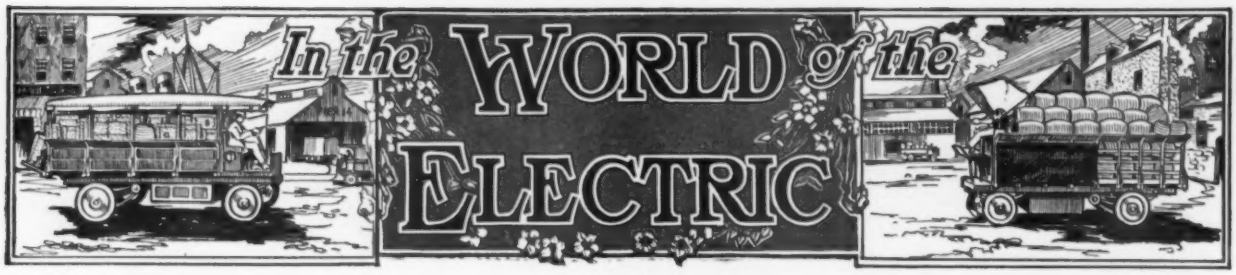


Diagram of Application of the Accelerater and Fuel Saver

preferred, the fluid may be omitted. It is claimed to have shown a 20 to 30 per cent. saving in gasoline. The price of this accelerator is $12.



General Assembly of Fischer Magic Internal-Gear Transmission



NEW ELECTRIC TRUCK FOR BREWERIES

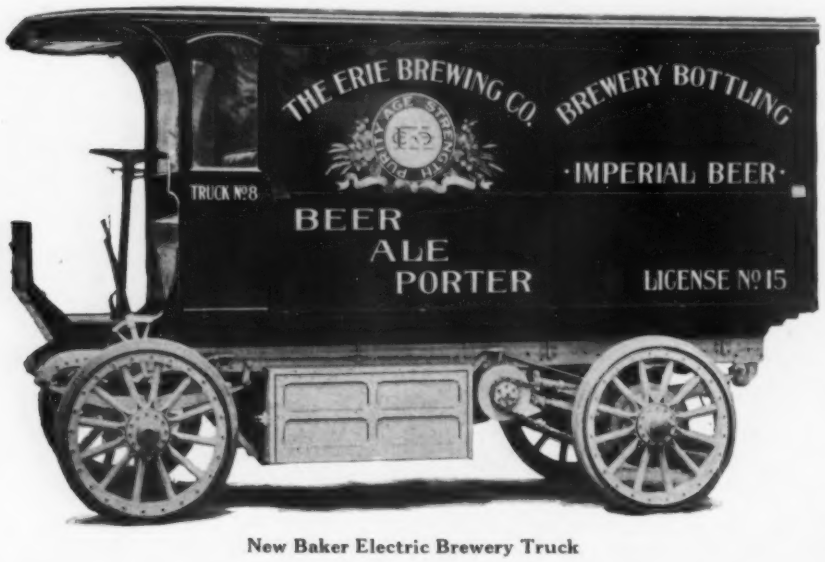
Owing to the growing demand among brewers for a light delivery truck to quickly handle their bottled goods in small towns and residence districts in larger cities, the Baker Motor Vehicle Company, Cleveland, Ohio, has perfected and now announces a new standard 3000-lb. truck for this service.

The body is very neat in appearance, with loading space 106 in. long, 46 in. wide and 60 in. high, carrying fifty-four beer cases of twenty-four bottles each per load. The cases are arranged in two rows nine cases long by three tiers high. The side panels of the body are made of two sliding doors, each one-half the length of the body, and no opening in the rear. Each door slides on roller bearings on an overhead track, which is always free from dirt. Each door has a spring lock, which cannot be opened without the key when closed. By using this system of doors the driver can take out any case of bottles without disturbing the rest. This arrangement saves considerable time. As the truck is unloaded and filled with empty cases, there is no handling of empties to get at the full ones, as is the case when access is made through the rear. The floor of the body slants toward the center from each side, thus keeping the cases from sliding against the doors and making them hard to open.

This body construction has been pronounced unique, complete, serviceable and very satisfactory. The Erie Brewing Company, of Erie, Pa., was the first to install this type of truck and is very well pleased with the work they have done. They report that during the heavy snowstorm in Erie in November these trucks made their regular deliveries when the company could not send out their horse-drawn vehicle. The trucks have not lost a single working day since put into service nearly a year ago.

On acount of its quality, speed and system of handling, this style of truck is a great saving over horse-drawn equipment when we consider the time saved between stops, returning for second load and reloading. It is also claimed to be easier and cheaper to operate than a gasoline truck, on the ground that there is no engine to start after each stop and to be left running while the driver is delivering and taking up his empties, which takes considerable time at many stops.

The Baker Motor Vehicle Company has also developed similar types of bodies adapted to handle full loads of 2½ tons (or 90 standard cases) and 4 tons (or 145 standard cases) of bottled goods. These body types are in addition to the regular brewery bodies suitable to keg and barrel delivery.



New Baker Electric Brewery Truck

G. V. BRINGS OUT A FIVE-TON TRACTOR

The General Vehicle Company, Long Island City, N. Y., has made another addition to its line in the shape of an electric tractor which has a capacity of approximately 5 tons on the tractor (a speed of 5 or 6 m.p.h. on hard level asphalt and a mileage of 35 under the same road conditions. It is designated as C-1683.

New G. V. Five-Ton Tractor With Trailer

The battery is a 31 G. V. X. with an ampere-hour capacity of 382. Hess-Bright ball bearings are used on the G. E. 1027-85-50 amp. motor. A continuous torque type controller is used.

Wheelbase is 74 in. and gage 69 in. The frame is heavy 6-in. channel. The artillery type wheels are mounted on Timken roller bearings. Solid tires are used, 7 in. front and 5 in. dual rear. Standard countershaft, springs, axles and brakes are used.

ELECTRICS IN CANADA

Many prospective purchasers of electric trucks in such cities as Boston, New York City, Philadelphia, Buffalo, Detroit, Chicago and Milwaukee, where there is considerable snow and cold weather in the winter, hesitate on this account, and such purchasers will, therefore, be interested to learn that in addition to the forty or more electric trucks of different makes in Winnipeg, one of the coldest of the Northern Canadian cities, there are also successfully operating in Toronto, one of the snowiest of Canadian cities, twenty-one electric trucks of different makes, notwithstanding the fact that up to the summer of 1912 there was not a single agent in Toronto demonstrating or exploiting in any way their sale, and

all the electric trucks which have ever been sold there have either been sold direct or through one pioneer agency, whereas there are fifteen or twenty agencies representing the best known gasoline trucks.

Regarding the winter conditions in Toronto, a comparison of snowfall in Chicago and Detroit for the winters of 1910-11 and 1911-12 will be illuminating, the following being the figures:

Chicago—Winter 1910-11	29.8 in.
Detroit—Winter 1910-11	50.2 in.
Toronto—Winter 1910-11	61.3 in.
Chicago—Winter 1911-12	39.6 in.
Detroit—Winter 1911-12	58.0 in.
Toronto—Winter 1911-12	76.4 in.

Experience in Toronto has shown, as in Winnipeg, that mere low temperature has no appreciable effect whatever on electric trucks, and has also shown that snow does not slow them up to the extent that mud or sand would do, as is also true of the use of gasoline trucks, the spring and fall muddy and rainy periods being actually the greatest deterrents to the wider use of trucks in Toronto, due to the fact that the outlying districts have many unpaved streets, where new building operations, new stores and new householders must be reached, and it is a fact that the electric trucks operating in Toronto for the past three years have never been laid aside except during such short periods after severe blizzards as necessitated the partial cessation of all deliveries by horse and motor.

The O'Keefe Brewery Company, the pioneer users of electrics in Toronto, have two trucks which have now operated for three winters and have two additional electrics which were purchased after the original trucks went through their first hard winter of 1910-11.

The Holt-Renfrew Company's electric, which was purchased only after its mate had gone through a Winnipeg winter, is passing through its second winter. The trucks belonging to the Canadian Express Company, Heintzman & Company and the Langmuir Manufacturing Company have all had the test of winter weather, and the continued repeat orders given by The Robt. Simpson Company were the result of the excellent showing of its first truck during all parts of the year.

A list is given below of the names of the users of electric trucks in Toronto, who, on inquiry, will be pleased to recite their experiences to all who are interested:

Robt Simpson Company, department store	5	Det.
Heintzman & Company, piano manufacturers	1	Det.
Murray-Kay Company, furniture	1	Det.
M. Langmuir Manufacturing Co., trunk manufacturers	1	Det.
Holt-Renfrew & Co., furriers.	1	Det.
T. H. Estabrooks Co. tea importers	1	Det.
Bowles Lunch, Ltd., restaurateurs	1	Det.
McClary Mfg. Co., stove mfrs.	1	Det.
O'Keefe Brewing Company, brewers	4	G. V.
Canadian Express Co., express.	3	G. V.
Toronto Electric Light Co.	1	G. V.
Toronto Electric Light Co.	1	Wav'ly
Total	21	

Several additional electrics should be included in this list, which are as follows:

One "Riker" 20-passenger wagonette, now 10 years old.

Three commercial 38-passenger sightseeing cars, assembled in Toronto, now 7 years old.

Five Motor Car Equipment Company 38-passenger sight-seeing cars, now 6 years old.

The above machines work for the Verral Company during the summer and a part of the spring and autumn, covering as many miles in that period as a good many commercial vehicles ordinarily cover in a whole year, and give excellent satisfaction, which is especially remarkable, as all are old types and have seen hard service.

In addition, this company operates a G. V. taxicab, which is upwards of 7 years old, and the extent of work which this car accomplishes can be understood from the fact that since June 1, 1913, it has covered 12,000 miles. This car runs the year round.

An additional 1000-lb. Waverly is found in the service of the Central Press Agency, Limited, 70 Pearl Street.

If you will add these trucks to the list already given, you will find that Toronto has in service thirty-two electric vehicles.

ELECTRIC TRUCKS HAVE WIDE RANGE

By F. NELSON CARLE

The man who owns a granite quarry, lime kiln or creamery 12 miles from the railroad need worry no longer about the prohibitive cost of getting his product to market. The motor truck is the solution. Again, the manufacturer who desires to move from cramped city quarters to the low ground rents, sunshine and cheap labor can locate on the river bank miles from the railroad if he wishes, and still handle raw and finished material with despatch. The motor truck makes this possible.

As a matter of fact, the big railroads are no longer able to build spur tracks to every little ice house, chair factory or brick yard. In many cases it doesn't pay, anyway. This is why the motor truck is being seriously considered as a feeder for branch lines and even main lines. One express company, which until recently had very little produce business in a certain city, boosted business in a unique way. In towns from 50 to 75 miles up the line they began to collect milk, cream, strawberries and other farm and garden products, which they put on the train, rushed into the city by 6 A. M. and by means of G. V. electric trucks had them at the commission merchant's door when the buyers began to arrive at 7 A. M. No wonder the railroads are beginning to welcome the motor truck.

Uncle Sam already uses electric trucks in eight navy yards, in four arsenals, and at various army depots, as well as at Washington. There are nineteen G. V. electrics in Manila alone, hauling ice and army stores. There is an immense field for trucks as United States army transports; in fact, we are away behind France and Germany in this respect. There must be nearly 500 trucks used in the transfer of mail in our large cities, and the parcel post opens up endless possibilities. In all these fields, with the possible exception of army work, the electric will give a good account of itself.

Then there is the industrial truck field, at present "unscratched." The battery truck crane, the baggage truck, the tractor and the small freight truck all have wonderful possibilities. The railroads, steamship companies, wholesalers and manufacturers are all making inquiries about the electric freight truck. It looms up large as the remedy for dock and terminal congestion. It is revolutionizing the handling of raw and finished materials about manufacturing plants. One slate mill recently moved 1000 tons in 24 hours with a single 2000-lb. G. V. freight truck, about 4x7 ft. in size. The amount of work these little "electric stevedores" will do is almost unbelievable.

And in the central station and electric traction fields the possibilities are also great. Winch equipped and hoist equipped electric trucks are, figuratively speaking, just being introduced. Horses have no business in most kinds of construction and repair work these days; they are too slow and expensive. Electric or gas division, it doesn't matter, the power wagon is the goods. Look at Asheville, Des Moines, Milwaukee, Vancouver, Rochester, Toronto and other cities with tower, emergency, coal, meter, cable or lamp wagons, and in some cases seven or eight varieties. Here is the New York Railways Company with 33 modern electrics the majority of them heavy duty machines, as witness the 14 3½-ton dump trucks. We'll pass over the possibilities of off-peak business for central stations, though many of them are helping the merchant to inaugurate an electric delivery system with splendid two-fold results. As at this writing only about one-third of even our larger central stations are using electrics in their own service, it will be some time before one can gauge the possible revenue from charging electrics, but we all know it will be an important item to the central station which goes after it in the right way.

The motor truck has a future so great that no one can intelligently approximate the demand for it. One can't gauge it by our 25,000,000 horses because it will do much more than replace horseflesh. The interesting question just now is, "How soon will there be 100,000 electric trucks in service?"

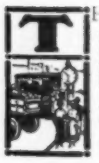
INDUSTRIAL LUMBER COMPANY'S G. V. TRACTOR FITTED WITH EDISON BATTERY

We are informed that the G. V. tractor used in saw mill work by the Industrial Lumber Company, of Elizabeth, La., as described in our February issue is not fitted with the Standard G. V. lead battery as stated by the makers, but with sixty cells of Edison A8 for this special service.

F. E. Whitney, general manager of the Commercial Truck Company of America, read a paper on February 24th before the meeting of the Electric Vehicle Association, on "Electric Commercial Vehicle Tires." The meeting was held in the United Engineering Societies Building, 29 W. 39th Street, New York City.

Old Truck Still Going Strong

Advice to Drivers by a Driver



THE truck in question was a 1909 five-ton American assembled at Lockport, N. Y., by a firm which has gone out of business, the American Truck Company. It was equipped with a 5½ x 6-in. four-cylinder, four-cycle motor of T-head construction, a two-speed and reverse planetary transmission and double chain drive. This truck had been run for nearly 3 years and had had seven drivers in that time, when the writer took the position.

The machine had to haul from 40 to 60 tons of coal a day, of 9 hours all the year round, winter and summer. The round trip was very nearly 5 miles, and it was all uphill with a load, with a grade of from 5 to 14 per cent., and a steady climb of ¾ of a mile, as the coal was being hauled to one place, the Syracuse University, at Syracuse, N. Y.

After I had been on the truck for a month, I saw that it was gradually going to pieces, especially the old planetary transmission which was completely worn out and slipping beyond any help whatever. I talked it over, and we took out the old planetary and put in a three-speed and reverse selective sliding gear transmission using the same differential which was in good condition with a few minor repairs. I had the motor shipped to the factory to be put in first class shape and put in a new steering gear, the old one being worn out for the lack of lubrication. After this, the old truck was again good for at least three years at a cost not exceeding $600, considering, of course, that it was taken care of.

The truck was put to work again August, 1912. It hauled an average of 39 tons of coal every working day until the latter part of March, 1913, without a single breakdown of any kind. The pulling it had to do through snow and on ice and always uphill was very hard, as this truck had to go out on any kind of a day. It weighed empty with driver 10,600 lbs., and with a five-ton load, 20,600 lbs.

During one month I hauled 1281 tons of coal. The truck was in continuous service, as it was the only means of getting coal up there, and it was next to impossible to use teams in the winter on account of ice and snow on the heavy grades. It would have taken six teams and men to do the same amount of work and sometimes ten if the streets were in a bad condition, so it will be seen how this truck had to be going, as it was the only one.

I resigned my position last October leaving the truck in good condition, climbing these grades on the high gear in good going, a gear never being shifted from the time of leaving the coal yard until ready to unload, excepting of course emergency cases in traffic; but it would throttle down very low on high with a full load, even though it was capable of going 21 m.p.h. loaded, which was of course too fast. I have been told by a number of truck representatives and agents that it had about the hardest work of any truck in the country.

Advice to Drivers by a Driver

Below are a few operating details for truck drivers of any make machine, taken from good sound experience of 5 years with them, and I hope it will do some good to all concerned in the motor truck business.

The driver of a motor truck has a great deal to do with its being a paying or an expensive investment to the consumer, and also can do a great deal toward the good or poor reputation of the builder. A good first-class truck man is almost worth his weight in gold to his employer and the maker of the truck. There are too many ex-taxicab drivers and others driving trucks. These men give trucks the undue setback regarding up-keep cost. This causes an adverse attitude in the minds of the individual and the large corporation, which has complicated transportation problems to solve and must keep the operating expenses down to the minimum.

If a driver can keep his truck running day in and day out with the smallest possible amount of up-keep cost, he will never be out of a position. If he would first imagine to himself, this—that this is my truck, I am working for myself—if he would do that and understands his business, he would surprise even himself, as he would follow these few important suggestions:

. Never load a truck over the capacity it is built for. Overloading is a principal source of trouble and if you have a very hard and rough road to travel, it is better to not give the truck its full load where it is possible not to do so, as 700 lbs. over 10 m.p.h. either light or loaded. Just because the engine is not equipped with a governor, don't take it for granted that it can be run faster just because it is able to, as therein lies the most detrimental of all things to a truck; especially when running light or empty with a heavy machine, take it easy, as every vital part of a truck gets the full road shocks, as the heavy springs do not work as freely as when the truck is loaded.

When turning corners with a load, let the truck float around if possible, or slow down so as to take the strain of hard pulling off the differential gears. Keep out of car tracks as much as possible and avoid all switch points, as there is nothing that will cut a solid tire carrying a heavy load as quickly as these do. If truck is straddle of a car rail, and it has to be taken off the track, make as sharp a turn as possible so the wheels and tires will roll over the rail and not creep along the side of it, wearing or cutting the edges of the tires. When crossing car or railroad tracks, slow down, and if it is a very rough crossing, you can't go too slow over it, as every jar or jolt kept away from a truck will prolong its life a surprising length of time. Another good tip for the driver of a heavy truck is to avoid manhole covers when he can, as the writer has come across a number of defective ones where it would be taking a chance to go over them.

If truck is of a jack shaft and double chain drive type with service brakes on the jack shafts, take extra precaution that emergency brakes on rear wheels are always in perfect working condition, and here I wish to state that both sets of brakes should be on the rear wheels, where they can always be relied upon, and do the most good. Never put too much confidence on jack shaft brakes in either ascending or descending a hill or grade, as a chain might either run off, break or climb up on teeth of sprockets and then break—an occurrence of this kind, though will rarely happen if the chains are kept in good condition and too little attention is given these—may cause great damage.

The chains should be kept well lubricated at all times, and adjusted to the proper amount of slack. The heavier the chain, the more slack it should have, but not too much. A good idea is to take chains off once a month, and clean them in a bath of kerosene oil, or boil them in lard oil, and when good and clean put them into another bath of oil. For economy, save the oil that is drained from the motor, which should be at least once a month, and, adding a little more to this, put chains into it for at least an hour to get thoroughly oiled through. When tightening chains be as accurate as possible in having both rear wheel sprockets exactly the same distance from jack shaft sprockets. If they are not evenly distanced apart, one side will pull harder than the other, besides causing trouble on a wet or slippery street.

A truck should be looked over every night by the driver, even though he has nothing to do with the repairing of it. And drivers should bear in mind that the most important of all nuts or cap screws is the loose one, as if these are found in time, it will, without a doubt, save a lot of hard work and time, which all counts up as expense. Every night or morning all grease caps should be given from a quarter to a full turn, depending on the part to be lubricated. These cups should be kept full and used, as that is what they are there for. That is another sadly neglected item with trucks. Don't waste grease or oil as enough does as much good as too much, which does no good at all, but is wasted and thrown out through the bearings or parts lubricated.

Every Saturday the truck should be looked over thoroughly with oil can in hand to oil all small parts such as small couplings on brake rods and fifty other small joints, that wear very rapidly through lack of a little oil once a week. These little things are sorely neglected. Spring leaves on a truck need lubricating once in a while, just the same as a pleasure car, and even more so, as they do more and harder work.

The consumer who has a good first-class truck driver and a good truck can make no comparison or hesitation whatever as to which is the better, quicker and cheaper. The motor truck, with its rapid heavy load carrying capacity, or the old horse-drawn method of a slow moving light load.

The Motor Vehicle and the Parcel Post

By J. J. SULLIVAN

STATISTICS for the first 6 months of the operation of the parcel post service are now available and are of much interest to the motor vehicle manufacturers. The report of the First Assistant Postmaster-General under date of December 11, 1913, has this to say of the parcel post service:

Parcel-Post Service

"The number of parcel post packages handled during the first 6 months of the operation of this facility was at least 300,000,000. Based on an actual count made at the fifty largest post offices and on the assumption that more than one-half of the entire business is transacted at these offices (a ratio borne out by postal receipts), the number of parcels handled in January, 1913, the first month the service was in operation, was 38,730,826. On the same basis the number handled in April was estimated at 59,546,678, or an increase over January of 53.74 per cent. The estimate of 300,000,000 parcels for the 6 months is based on these figures with due allowance for the usual falling off in business during the summer months.

"That this vast quantity of mail has been handled to the satisfaction of the public is evidenced by many expressions of commendation and the fact that few complaints of unsatisfactory service have been received.

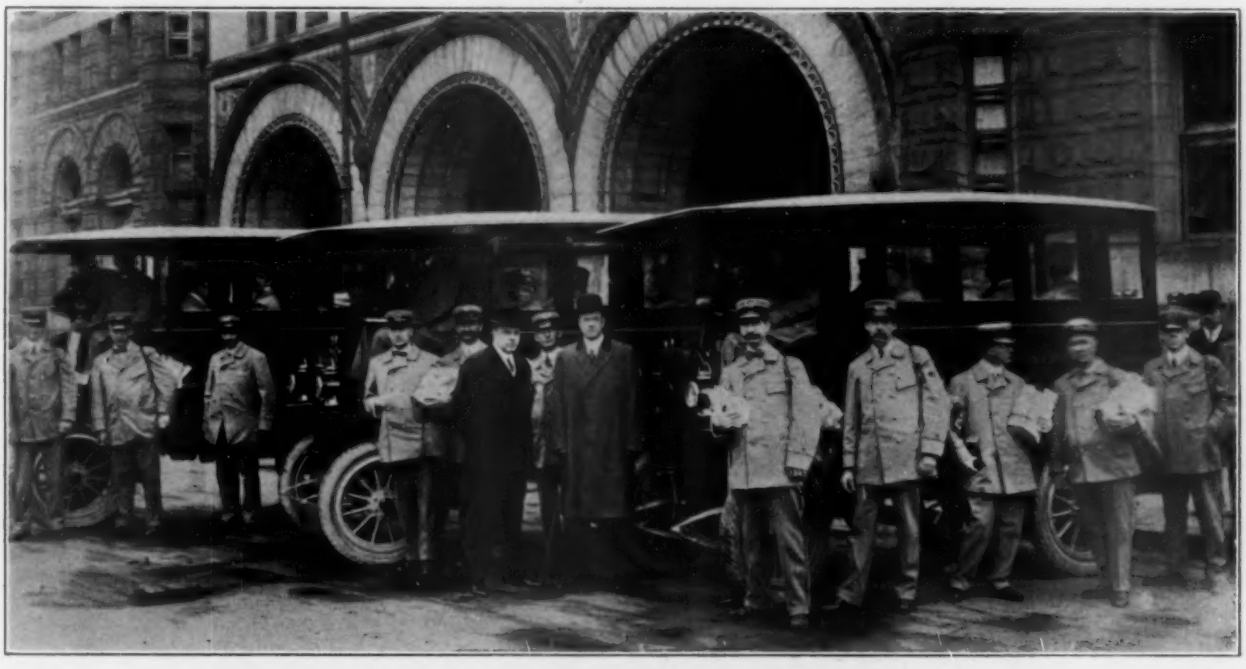
"When the parcel post service was started no special plan was devised nor adequate additional equipment provided to insure its administration. Postmasters were authorized to employ such methods and means as might appear to be necessary for the proper transaction of the business, and they were thus left largely to their own resources to meet the demands of the service in their communities, with the understanding that the department would authorize such expenditures as might be required.

Government-Owned Motor Vehicles

"The rapid growth of the parcel post service since January 1st last has made it necessary for the department to give more serious consideration than ever before to

Hand Truck Used to Bring Parcel-Post Packages to the Truck

The hand trucks are wheeled by the helper, from the interior of the post office to the loading platform, and the driver loads the small delivery car, routing the load as he places it in the vehicle; that is, arranging it for delivery according to his route. A good idea of the size and character of parcel-post packages is given.



The New Motor-Driven Mail Wagons, at Washington

Postmaster-General Hitchcock and Postmaster Merritt, of Washington, inspecting the new vehicles in front of the Washington Post Office

the collection and delivery features of the service. Carriers on foot are able to deliver only about 75 per cent. of the parcel post mail. It is therefore necessary to employ vehicles for this purpose and both horse-drawn and motor conveyances are now being operated under rental contracts.

"The horse-drawn vehicle is the least expensive, but the territory it can cover is very limited. The motor vehicle, on the other hand, is capable of covering greater distances and for many other reasons is more desirable, but the extra cost on a rental basis adds disproportionately to the expense of delivery.

"Because of the increasing average weight of parcels and the consequent increasing need for vehicles, the department has undertaken to ascertain the comparative cost between operating rented and Government-owned motor vehicles. For this purpose twenty 1500-lb. automobiles have been purchased and are being operated for parcel post delivery and general collection service as follows: Three each in Baltimore, Md., and Brooklyn, N. Y.; two each in Buffalo, N. Y., and Louisville, Ky.; four in Minneapolis Minn, and six in Philadelphia, Pa.

"Twenty-one 800-lb., three-wheeled motor vehicles have also been purchased and assigned as follows: Five to Baltimore, Md.; four to Buffalo, N. Y.; three each to Louisville, Ky., and Nashville, Tenn., and two each to Atlanta, Ga., Columbus Ohio, and Detroit, Mich.

"It is proposed to train the carriers in the operation of smaller machines and to use them in suburban sections where it is believed they will prove both satisfactory and economical. The experiment has not progressed sufficiently to determine at this time the advisability of further purchases."

The statistics on cost of delivering show a wide variation in various cities, from 1.7 cents per package in Nashville, Tenn., to 14.9 cents in San Francisco, with an average cost of 5.82 cents throughout the country. This had been reduced to 5 cents in October notwithstanding the increased weight limit and reduction of rate which went into effect in August. This is a very good showing when it is considered that the department insisted on the rule that regular carriers must make all deliveries of parcels from the vehicle and under no conditions were private individuals permitted to handle parcels, this necessitating a carrier on every vehicle in addition to the driver.

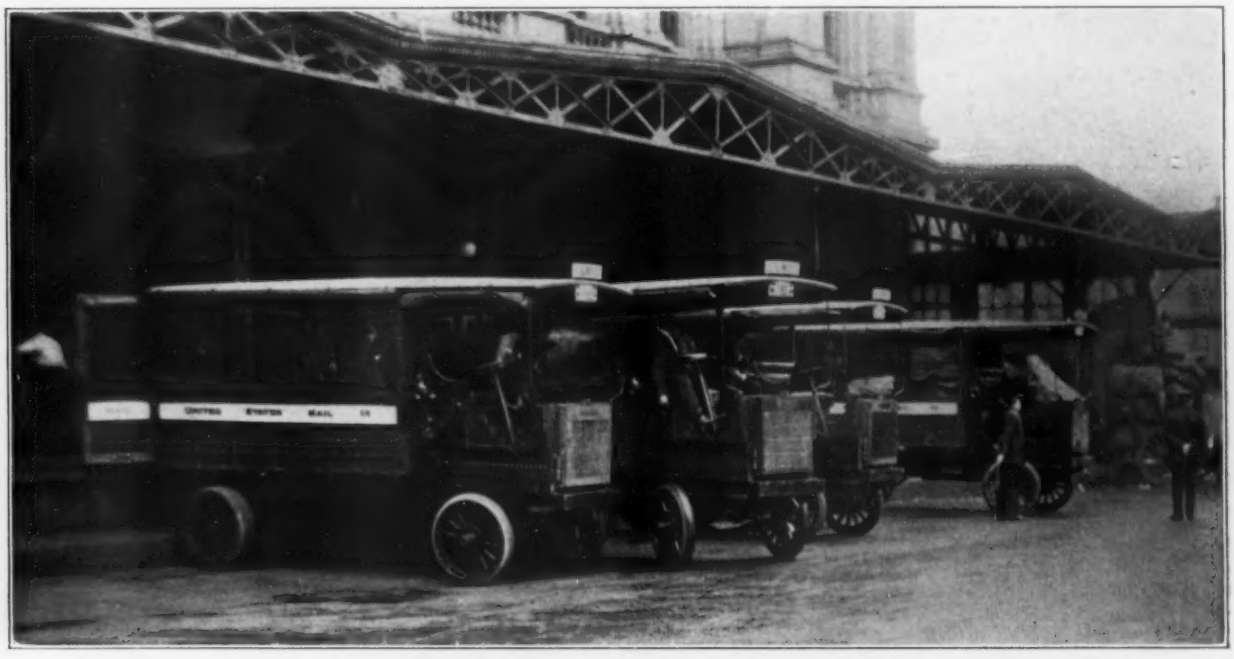
When these figures were compiled the 11-lb. limit was in effect through all zones. In August the limit was increased to 20 lbs. in the first and second zones and on January 1, 1914, the 20-lb limit was extended to all zones and the limit for the first and second zones raised to 50 lbs. This will materially decrease the number of parcels delivered by carrier on foot and increase the percentage delivered by motor vehicle.

Parcel-Post Three-Wheeler

These small three-wheeled vans are now in use in New York City, for hauling parcel-post packages. In the above photograph the mail man is seen placing the first parcel-post package in the vehicle

Estimate of 1915 Business

The Postmaster-General estimates that the department will handle 600,000,000



Large Mail Trucks Loading During Strike

Mail trucks being loaded under the protection of the police during the recent mail drivers' strike

parcels for the fiscal year ending June 30, 1915, which would seem to be a conservative estimate considering the growth for the first year and the increase in weight limit. Based on this estimate the number of parcels to be delivered by other than carrier on foot should be close to 200,000,000 packages for the year.

The twenty automobiles purchased for collection and delivery were gasolene cars, but it is to be hoped that the electric will also be given a trial for this work. The electric is especially fitted as the stops are frequent and delivery distances limited. The regular carriers could be trained to operate the electrics thus saving the expense of a driver. Very little time is lost in starting and stopping and with improvements introduced by some of the electric car manufacturers, the carrier by removing a small switch handle and taking it with him the brakes are locked in position and car cannot be moved until the handle is replaced on the carrier's return. This principle could also be applied to the body of the car so that when the same handle is removed the body of the car would be locked, and unlocked when handle is replaced, thus permitting carrier to make his deliveries without danger of loss to the contents of the car.

Commercial Car Service Satisfactory

In the report of the Second Assistant Postmaster-General he has this to say of the screen commercial car service:

"The successful operation of screen motor-wagon for screen-wagon service in cities has continued. The service on the screen-wagon routes at New York City, Detroit, Mich.; Milwaukee, Wis.; St. Louis, Mo., and a part of that at San Francisco, Cal.; is under the provisions of contracts covering service performed by motor vehicles, such service having continued at New York City, on the uptown routes and extended to the downtown route under the new contracts. The general advertisement now pending for screen wagon service in the fourth contract section contemplates the continuance of screen motor-wagon service at San Francisco, Cal., from July 1, 1914, and provides that proposals to perform service on any of the routes in that section in automobiles will be considered."

With the resources of the post office department and the probable further increase in the weight limit of parcels, to which the present Postmaster-General has expressed himself in favor, the parcel post will in time create a demand for commercial cars that will probably exceed the demand in any other line of business in the country.

FEW ANTI-SKID DEVICES ON DETROIT TRUCKS

Until the first week in February the winter was so open in Detroit that street traffic conditions were almost as good as in summer. However, the past month has been a trying one for all vehicles although no complete tie-ups have been reported. Just before the hard snow of February 6th and 7th a sheet of ice was formed over all the pavements and on this was spread about 5 in. of comparatively dry snow. the resistance of the snow, although a big factor in horse haulage, was practically nothing in itself but the combination with the ice caused many motor trucks not fitted with any form of anti-skid to stall through the spinning of the wheels, especially when trying to get away from the curbs.

Abuses and Drawbacks of Anti-Skids

The unusual sight of a stalled three-ton truck being started on its way by the pushing of two rather lightly built men lead to an investigation of the causes for the small number of tire chains and other anti-skid devices used on the local trucks. A canvas of the service stations, large truck users and tire manufacturers brought out that such devices are almost a necessity on snow covered ice, but that their use under most conditions of winter driving has many abuses and drawbacks. The following are some of the reasons given against their use. A broken or very loose tire chain is considered especially dangerous on chain driven trucks. On a number of trucks there is not sufficient clearance allowed for heavy tire chains. Where the chains are heavy enough to stand the wear the damage to the whole truck is considerable if they are left on and much driving is done where the snow has been cleaned off or packed down solidly. The damage to both car and tires is greatest where only a few single cross chains are used and these are anchored to the spokes. The tires suffer particularly where the driver puts these chains on very tight in order to save trouble of having to take them up so soon when they begin to stretch.

The manager of one of the large service stations feels that the abuse of the use of chains is so great that it is better not to equip with them at all. To substantiate this a truck was pointed out which had a single cross chain fastened to one of the spokes. It looked as if it had been in that position all winter and the damage it had done to the tire was very noticable. This official also said that even with the much greater number of trucks now in use that the reports of stalling were fewer than 3 years ago and credited this to the greater skill of the present drivers.

Problem Solved by One Company

The problem seems to have been well solved by a fuel and builders' supply company which operates nine big trucks. Two of the three-ton trucks belonged to a company recently taken into the combine and are not yet equipped with chains. The other seven carry chains for use in case of stalling. The drivers are forbidden to keep the chains on except where the conditions require their use. In this case they might be considered emergency equipment.

The Detroit Fire Department, on the other hand, keeps chains on all of its motor apparatus as long as there is any snow on the streets. These chains are heavy, of the continuous type and have a large number of cross chains. They are kept moderately tight by either springs or straps fastened to a steel ring on the outside of the wheels. The set on the largest aerial ladder in the service, which averages about three runs a day at this season, is 3 years old and one of the tires is over 2 years old. Both the chains and tires look in good shape.

Should be Used Only When Needed

The meat of the investigation is that some form of anti-skid device is very valuable for obtaining traction under some conditions and should always be carried for an emergency. Such devices should not be kept on except when they are absolutely required because, when driven on clean pavements or hard packed snow, the damage done to both the truck and tires figures up to a larger money loss than does the time required to put them on when the need arises and take them off again when it has passed. This applies particularly to heavy trucks. In the case of light delivery cars, especially when shod with pneumatic tires, tire chains should be used in the same manner as on heavy touring cars and should be kept on as long as there is any danger of skidding or loss of traction on any part of the routes.

Studebaker in Postal Service

This machine, owned by O. H. Baldwin, Detroit postal contractor, is typical of a large class of light trucks used by postal contractors all over the country

Making The Truck Pay

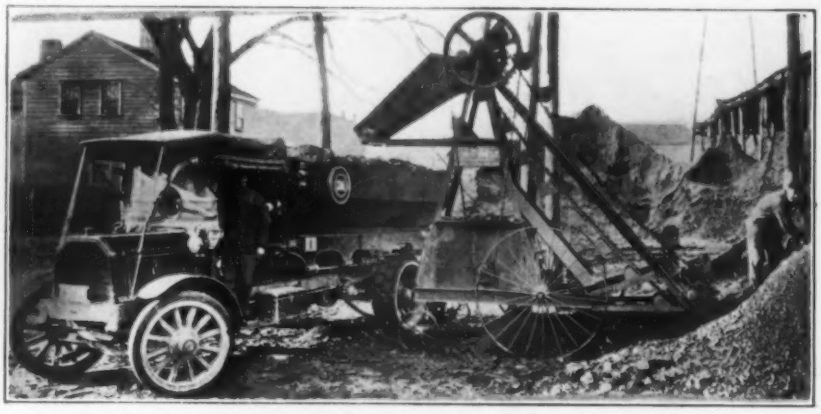
By H. D. PRATT, Engineer, Link-Belt Company, Philadelphia, Pa.

The permanence of the motor truck is assured by its ability to carry bulk material long distances in quantities unheard of ten years ago, and at a high rate of speed. The truck makes it possible to materially reduce the cost of transporting large quantities of stone, coal, sand, gravel, etc. The speed of travel is high as compared with the horse-drawn vehicle. The unloading is automatic, the body being dumped by the mere turn of a lever by the truck operator. In many cases the truck is loaded from an overhead chute, but more often the material to be moved lies on the ground in storage piles, not only in regular storage yards, but in streets, roads and wherever most convenient to store. The loading of this material from ground storage piles becomes a different matter. The high cost of loading trucks with material carried on ground storage is one of the factors which have retarded the sale of trucks for this work.

The truck which is so quick and convenient for handling several tons at a load, must necessarily be high to hold the load. Shoveling by hands means that the truck spends more than half its time waiting at the storage pile to be loaded, and between trucks the shoveling gang is idle. A good average day's work for a shoveler is twenty tons of gravel, less of stone, and slightly more of sand. Not only is the truck standing idle while being loaded, but the loading by hand costs 8 cents to 12 cents a ton. Here is a bad leak in what should be an up-to-date and efficient job of handling.

The portable wagon and truck loaders effectively stop this leak. A bucket elevator is mounted on large wheels, and with power supplied by a motor or gasoline engine, will load sand, gravel or coal at the rate of a ton per minute. The truck driver trims the truck with a shovel, and one, two or three men, depending on the nature of the material to be handled, trim and feed to the loader. This combination will load the truck at a cost of 2½ cents to 5 cents per ton, the higher cost being that of handling crushed stone with coal at the low end, and sand and gravel following in order. The saving of about 6 cents per ton thus effected is a large item in these days of close margins and competition, and marks the loader as a useful and necessary adjunct of the motor truck.

There is also a growing demand for a further combination of truck and loader,—namely: a truck with loader elevator mounted on the rear end of the body, arranged to lower into a storage pile when the truck is backed up to it, and also to raise clear of the ground when not in use. The elevator is supported independently of the dumping body and is driven, through a clutch, by a connection to the truck transmission. This combination results in a truck which can be loaded by its driver with or without a helper in a few minutes, and does away entirely with the necessity for a loader-operator who is idle between trucks. These loaders are made by the Link-Belt Company, Philadelphia and Chicago.



Link-Belt Loader Handling Soft Coal

Link-Belt Loader for Retail Coal Man's Use

REO TRUCK DEPOSES MULE-DRAWN TEAM

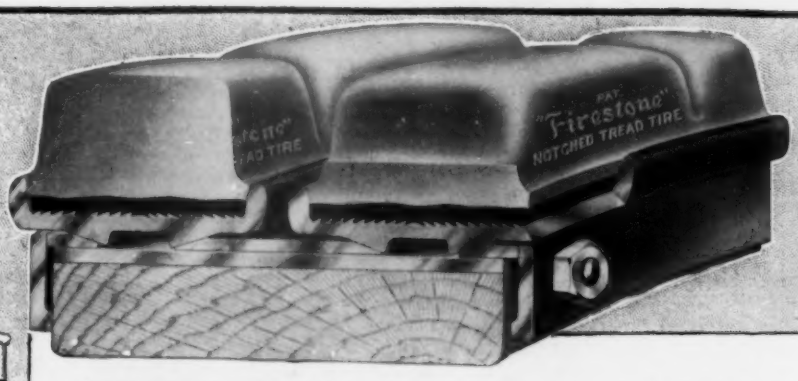
The quartermaster's department of the State of Michigan has definitely discarded mule-drawn vehicles in favor of those motor driven. In the event of the mobilization of the troops of the State for war or for any other purpose, the vast amount of hauling made necessary would be done with gasoline instead of with horseflesh.

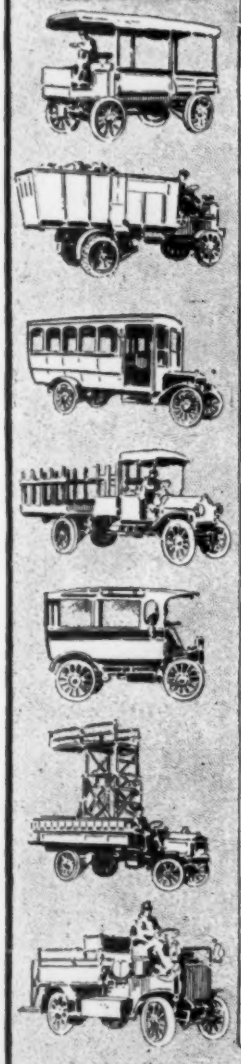
Colonel Walter G. Rogers, the quartermaster general, has been using a Reo motor truck since its purchase for his department June 1. The truck has proved itself at Lansing, at the Calumet strike duty camp, and on the State military reserve at Grayling.

It is a two-ton vehicle which does the work on an average of four teams and wagons every day—sometimes more than that, hardly ever less. The daily cost of operation, figuring depreciation, tires, repairs, gasoline, driver, interest on the investment and all other possible costs is $8.70. Four teams with wagons and drivers, cost $20 per day, to hire, not to own. The proprietary cost, when feeding the horses is considered, is much higher.

The Public Service Express Company, Inc., New York City, has ordered fifty Stegeman trucks.

Firestone Notched Tread—Continuous Base—Made for Dual or Single Equipment





THERE is always plenty of business ready for the man whose service is ready. And there is no better way to keep your truck service always in commission than to equip it with Firestones—the tires of sturdy, dependable wear.

The Firestone Quick Removable Rim Equipment supplements the work of our service stations. Your own drivers can make the change quickly and easily.

Firestone

Truck Tires and Rims

A Style for Every Load, Road and Service Requirement

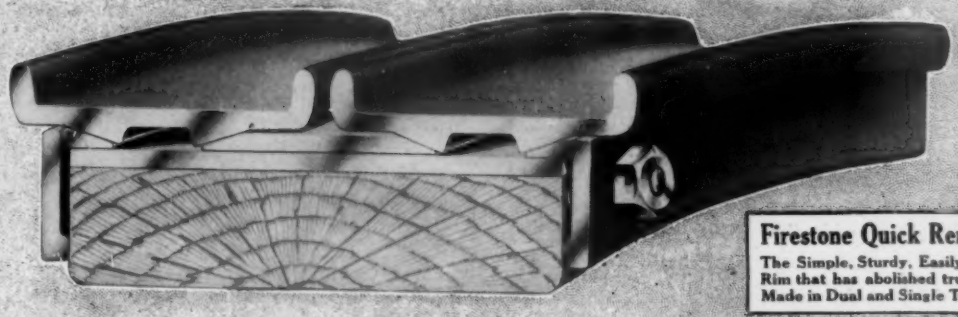
Concentrated, specialized efforts to make the most efficient tire in the world for heavy service have evolved the Firestone Notched Tread Truck Tire. The notches eliminate traction wave, and the continuous base absorbs vibration and distributes shocks. The rigid side channel, with upturned flange, protects the base and adds strongest possible support to fastenings. Made in single and dual treads. The quality of Firestone rubber and Firestone treatment gives the exact shading for long, strong, active service.

We take especial care to see that your trucks are equipped with the exact tire suited for their carrying and travel conditions. Expert service in all cities. Write for catalog. Then telephone for the Firestone man for expert advice on the right equipment for your special needs.

The Firestone Tire & Rubber Co., Akron, O.—All Large Cities

"America's Largest Exclusive Tire and Rim Makers"

Pneumatic Tires, Truck Tires, Pleasure Electric Tires, Carriage Tires, Fire Apparatus Tires, Rims, Tire Accessories, etc.



Firestone Quick Removable

The Simple, Sturdy, Easily Operated Rim that has abolished truck delays. Made in Dual and Single Types.

A THREE-TON REMOVABLE FURNITURE BODY

A very novel and useful body is that recently brought out by the Standard Motor Truck Company, of Warren, Ohio. This body is intended for furniture moving exclusively and is very well adapted to that use. The truck's capacity is four tons with the van body removed and three tons with both bodies in place in service.

The dimensions of this body are 7½ ft. high, 6 ft. wide, and 13 ft. long, all being inside dimensions. However, these dimensions can be changed readily to suit the customer, at the same time increasing the truck's wheelbase proportionately, so that he may use, for example, a body 15 ft. long, 6 ft. wide, and 8 ft. high, the van body being only 38 in. from the ground without load.

The construction of the inside is very smooth, that is to say there are no protruding bolt heads or obstructions of any kind that would mar the finest finish on furniture. The company thinks that it is much better to use the regular furniture pads in packing the load in preference to attaching any pads permanently inside the body. The outside corners of the body are round, there being no projections to interfere with traffic in narrow alleys or in making short turns. However, there is a guard rail, which is a part of the platform body, 6 in. away from the sides of the van body proper, to form a protection to lettering and paint and preserve the outer appearance. The tail gate is 38 in. high, and heavy folding iron doors are recommended to make it possible to completely close the body with attached locks so that the truck can stand on the street at night without any danger of the contents being "removed."

The job is complete as far as lighting is concerned. There are three inside lights, which also act as danger signals at night at the extreme front corners of the body and in the rear. These lights are also a convenience in loading or unloading the body after dark. These, with all the light equipment, are electric, being supplied from a 6-80 storage battery and the Kemeo fan-type generator. The complete electric light equipment—lamps, wiring, battery, etc.—is about $100. An electric starter is furnished as extra when desired.

It is optional whether or not a floor is used, which is a part of the van body itself; this arrangement would enable the user to hoist the body proper loaded with furniture from the truck, ready for unloading, for example, in a warehouse. On the other hand, if the machine is not to be used in conjunction with a storage warehouse, a single main floor is recommended, this floor being a part of the platform body and not interfering in any way with the combination. To raise the van body free from the truck it is simply necessary to attach four hooks to the top corners of the body, and the cost of the lifting apparatus is approximately $50. It remains permanently in the garage, and the body can be raised by two men, the stakes placed in position, and the truck driven away inside of fifteen minutes, ready for business as a regular stake body job.

The body is made in four distinct sections, dovetailed together so strongly that it is in no way affected when hoisted free from the truck, even when loaded with heavy merchandise. It will easily allow for loading into ocean liners for foreign shipment.

Four Standard Jobs

One-ton worm drive, one and a half ton worm, one and a half ton chain and two and a half ton moving van. The last is the latest addition to the line manufactured by the Standard Motor Truck Company, Cleveland, Ohio. It has a capacity of two and a half tons besides the body, which can be removed by lifting it by the four irons at the top corners and then a stake platform substituted. The van body is 162 in. long, 72 in. wide and 80 in. high. The truck, with both bodies, sells at $3500.

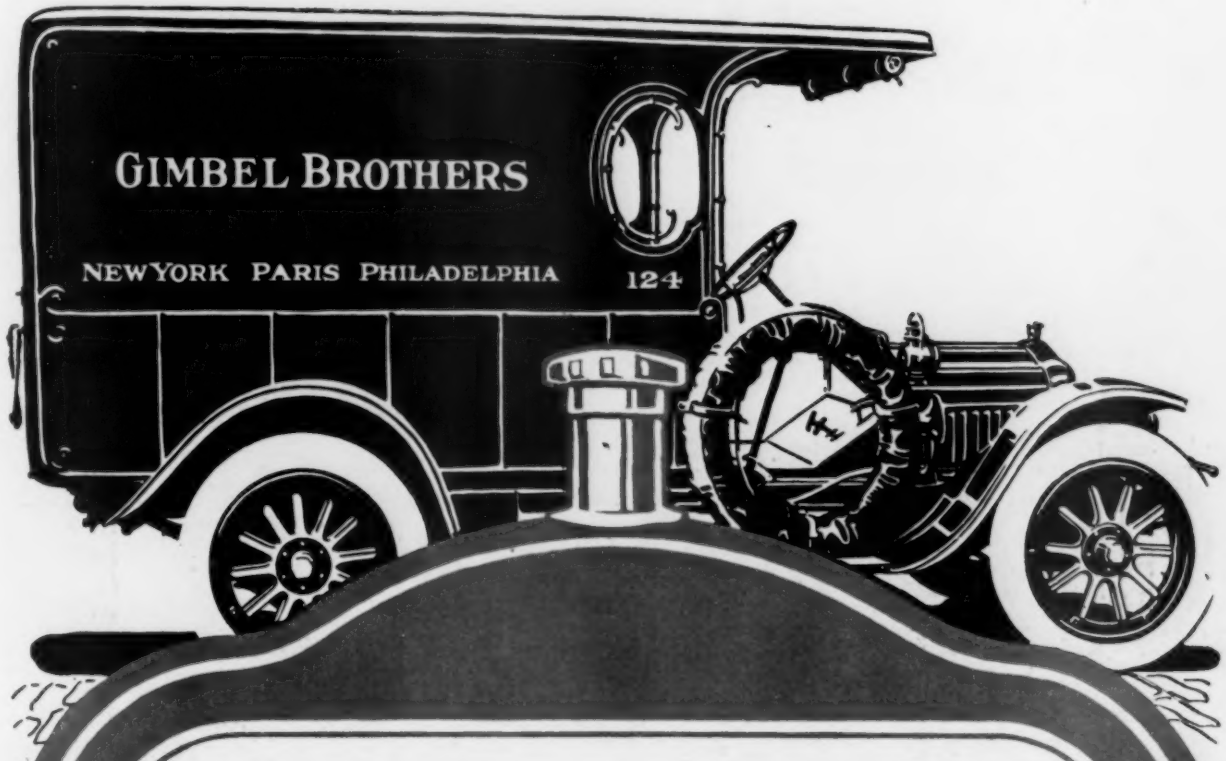
Standard Three-Ton Moving Van—Body Being Removed

The lifting apparatus is attached to four rings, one at each corner of the body's top, the body is raised and the truck driven from under it

Classified Advertisement

GREAT OPPORTUNITY.—FULLY EQUIPPED GAS MOTOR MANUFACTURING PLANT FOR SALE. This plant, up to three months ago, has been in continuous operation for over ten years and is now in first class condition to go right on turning out motors. The plant includes besides its eighty machines, (comprising Lathes, Milling, Gear Cutting and Grinding Machines, Drill Presses, J. & L. Automatics, Planers etc.), full equipment of original Tracings, Blue Prints, Patterns, Dies, Jigs and full assortment of small tools and all necessary utensils for producing Motors and Motor Parts. Stock room now contains about $20,000 worth of finished motor parts, valuable for filling repair orders for the upwards of two thousand (four and six-cylinder), motors now in active use and operation.

THIS IS A GREAT CHANCE FOR SOME ONE DESIRING TO GET INTO THE CYCLE CAR GAME.—This entire proposition is to be sold, at the plant, 13 E. William St., at eleven o'clock A. M. March 27th, 1914. Correspondence or personal interview solicited: Address THOS. C. BASSETT, TRUSTEE OF KIRKHAM MOTOR MANUFACTURING CO., BANKRUPT, BATH, STEUBEN CO., N. Y.



PRESTIGE IN MOTOR TRUCKS

Business firms are frequently judged by their equipment.

To adopt White Motor Trucks indicates that you are willing to pay the price necessary to possess the best. It effectively demonstrates the fact that you place best service above all consideration.

An important point of genuine satisfaction associated with the ownership of White Motor Trucks is this knowledge:

You are represented by those motor trucks that the majority of leading commercial establishments everywhere have, after thorough experimentation, selected for the completion of their motor truck fleets.

THE WHITE COMPANY

CLEVELAND

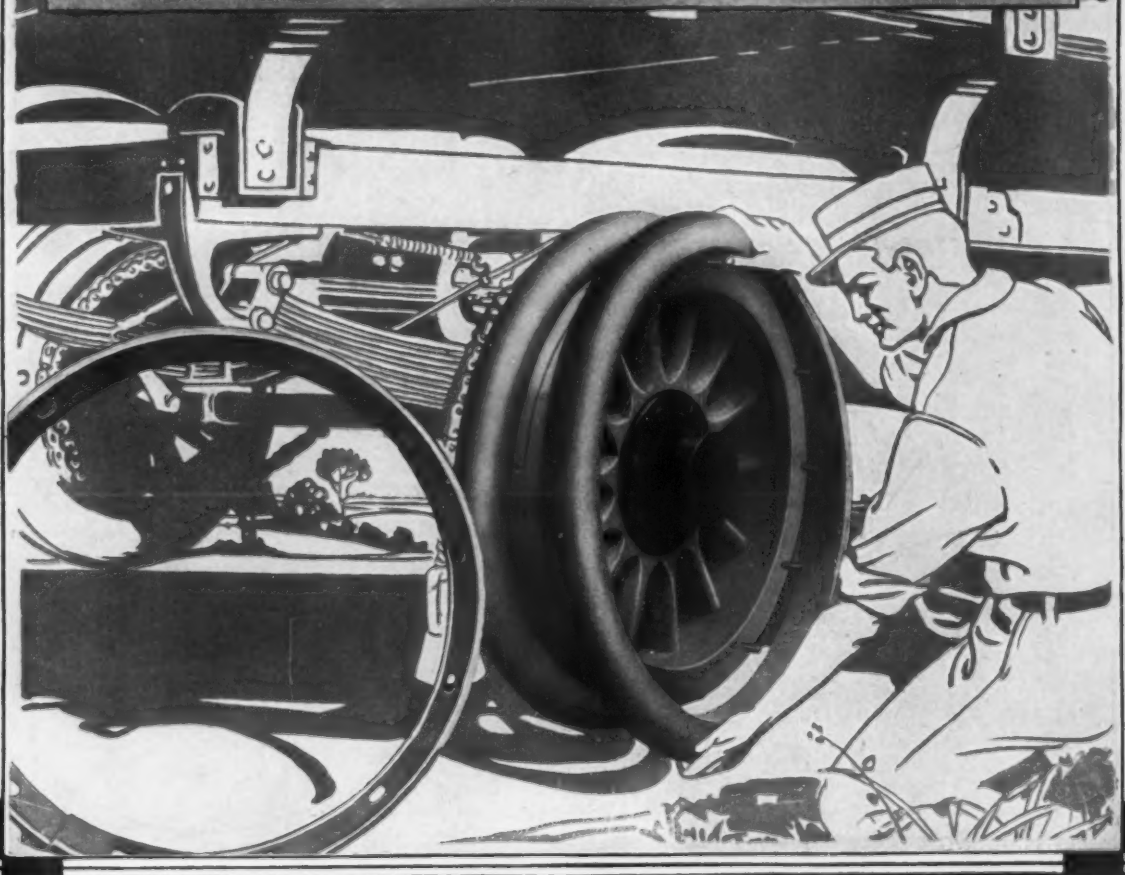
Both in quantity and value of production, the largest manufacturers of commercial motor vehicles in America.

Motor Trucks Cut Hauling Costs

But to show the maximum saving they must be equipped with UNITED STATES MOTOR TRUCK TIRES. There are two reasons for this:

1st—UNITED STATES MOTOR TRUCK TIRES are long service tires.

2d—Their use lowers repair bills. When changes are necessary your own men can make them, either in your garage or on the road.



United States Motor Truck Tires

SERVICE STATIONS IN ALL PRINCIPAL CITIES

When Writing, Please Say—"Saw Your Ad. in the C C J"

Bearing Metals and Gear Bronzes

In the world's great engineering feats, where millions upon millions of dollars are involved, there is no such thing as a compromise on the material employed. The specifications invariably read—

"Cramp Bearing Metals and Gear Bronzes"

This fact is highly significant and a fitting tribute to the quality of CRAMP products. For years they have held the preference of the most renowned engineers.

When the United States Government designed the stupendous Panama Lock Gates, requiring enormous gearing and bearings, it unhesitatingly specified **CRAMP METALS.**

The best motor cars and trucks, those famed for their sturdiness and long service, boast the **CRAMP METALS.**

The World's greatest battleships have spread the fame of **CRAMP METALS** world wide. The high standard of precision, accuracy and quality set in these battleships is not approached in any other engineering feats.

Everywhere and every day **CRAMP METALS** become a part of some great commercial enterprise, simply because their quality is known. Why experiment? Specify—

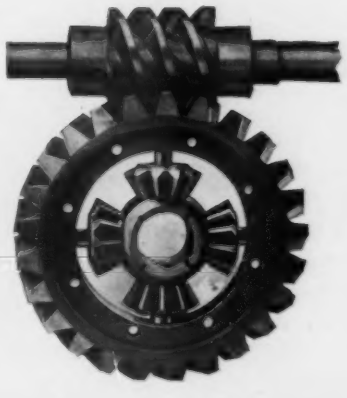
CRAMP

Every nation on the face of the entire globe has endorsed **CRAMP METALS.**

We have been making **WORM GEARS** for over sixty years—our first gears are still in service. This **WORM-GEAR** knowledge, backed by a hundred years of experience in manufacturing metals, guarantees the **CAR MANUFACTURER** a feature, the prestige of which alone will increase his sales and put his car in the limelight of the buying public.

Write us about it.

There is no necessity of your importing metals, it costs you time and money. The very metals you would import are those that have been discarded in foreign countries in favor of **CRAMP METALS.**



The William Cramp & Sons Ship & Engine Building Co.

Philadelphia Pennsylvania

Truck Operations are Constantly Interrupted for Spring Repairs

Operating Sheets Show

Costs for Spring Repairs, which mean **Increased Maintenance**

Lost Truck Hours, which mean **Decreased Service**

You Bought SERVICE! Do you get Spring Service?
Broken Springs can be eliminated, but only by

THE AMES Equalizing Spring

A leaf spring placed under the clips to take THE RECOIL

It is the RECOIL that BREAKS your springs

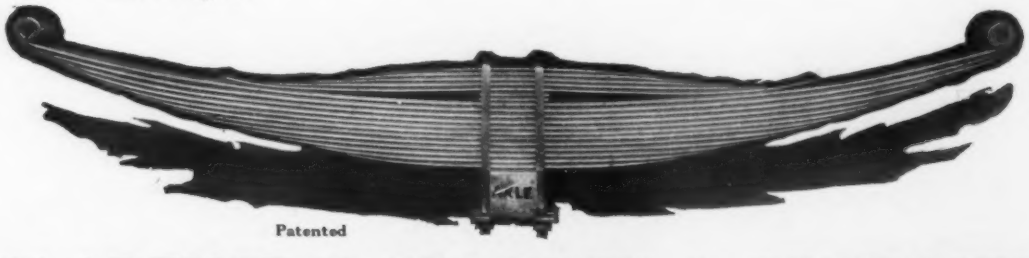
Cushion Recoil with the Ames Spring just as the Truck Spring cushions compression

Lost time for Spring Repairs is a proper charge against maintenance

Cut your operating costs

Notice steel spacing plate between two springs

Investigate



Patented

CLARENCE N. PEACOCK & COMPANY

EXCLUSIVE LICENSEES
DEPT. M

1790 Broadway, New York, N. Y. 5986 Center Ave., Pittsburgh, Pa.

When Writing, Please Say—"Saw Your Ad. in the C C J"

A Bowser Storage System Has All The Security Of A Burglar And Fireproof Bank

When you acquire money, stocks, bonds, notes or other securities, you don't let them lie around loose, but put them in a safe place. They are ***the motive power*** of your financial business and you can't afford to lose even the smallest fraction of their value.

News items tell daily of the loss of such wealth by fire, theft or mysterious disappearance and you pity the losers, whose misguided judgment would not let them store their money or securities in a safe place.

Yet, strange to say, many who would thus pity have invested huge sums of money in motor trucks, garages and equipment, but refuse to store the motive power of ***that*** business in a safe place.

Some men who would demand an instant investigation if they lost 2% of their financial motive power will unconcernedly let 20% of their **vehicular motive power** be lost through surface storage and do nothing to correct it.

Are you one of them? If so, be logical! Apply to the storage of your gasolene and oil the same precautions you would to your money. Put them where they are safe from fire, theft and disappearance! Give them all the security of a burglar and fireproof bank! Put these valuable and all-important liquids in a

Bowser Safe Oil Storage System

With it your gasolene and oil are stored in a safe deposit vault under the ground, where they cannot evaporate or escape, where fire cannot reach them, where changing temperature cannot affect them, where impurities cannot defile them, where they preserve their full strength until used and where they are always instantly available.

You transfer it as needed ***direct*** to your car without exposure to the air by a self-measuring pump. Nothing is lost in transference and you know where every gallon—nay, every drop—you pay for goes, and how much each car costs you to run. There is no ***guesswork*** about it.

Surely, this appeals to your business judgment. A **BOWSER SYSTEM** is safe, dependable, economical. It has saved money for thousands during the past 28 years. Isn't it reasonable to suppose it will do as much for you? Then write for details. **Prices, styles** and **sizes** to exactly meet your needs.

LOOK FOR THE ON THE ROAD RED SENTRY

S. F. BOWSER & CO., Inc.

HOME PLANT AND GENERAL OFFICES

Box 2118 **FORT WAYNE, IND.**

Sales Offices in All Centers and Representatives Everywhere

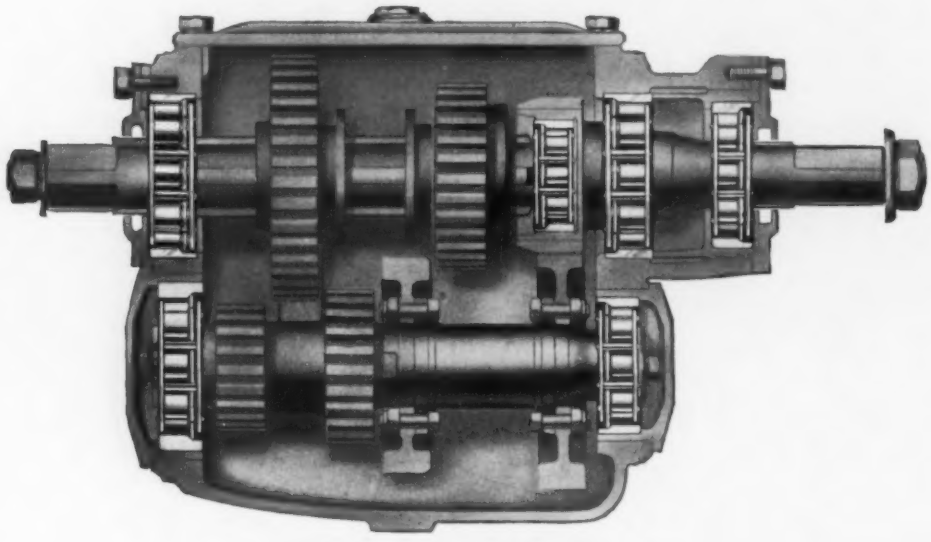
Original Patentees and Manufacturers of standard self-measuring hand and power-driven pumps, large and small tanks, gasolene and oil-storage and distributing systems, self-registering pipe-line measures, oil-filtering and circulating systems, dry-cleaners' systems, etc.

ESTABLISHED 1885

WHEN AT HOME USE A BOWSER

When Writing, Please Say—"Saw Your Ad. in the C C J"

"BOWER SAVES POWER"



Transmitting All the Power

The requirements of a satisfactory transmission gear are few but important. It must operate without noise. It must not need adjusting. It must have long life. The experience of many prominent manufacturers of motor cars has demonstrated that Bower Roller Bearings squarely meet these requirements.

Besides, "Bower Saves Power"

NOTICE: The Bower Roller Bearing is patented in the United States and foreign countries. INFRINGERS of our patent right to MAKE, USE, VEND or SELL will be duly prosecuted.

BOWER ROLLER BEARING CO.
DETROIT, MICH.

When Writing, Please Say—"Saw Your Ad. in the C C J"

When Writing, Please Say—"Saw Your Ad. in the C C J"

Silent **Lippard-Stewart** Powerful

Quality a Guarantee of Service

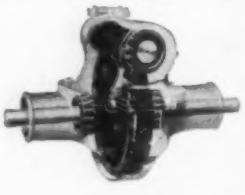
The sign of the satisfactory truck can be found only in the truck itself. Service maintained by almost continuous adjustments, frequent repairs, and by extravagant use of fuel and oil, is not efficient service. What dependable, business-producing, economical truck operation requires is ample provision against breakage, wear, complications and waste.

Strength and Power for Emergencies

Lippard-Stewart trucks embody completely this standard of successful service. The out-of-the-ordinary job, the unusual condition which the truck at sometime encounters, are anticipated everywhere in the construction. With power suited to roads of all characters, hills, heavy pulls or asphalt, with reserve strength to safeguard against abuse or severe usage, with convenience of design and lack of complication that makes neglect almost impossible, the Lippard-Stewart is prepared for commercial work as no other truck.

Worm Drive a Step Ahead

The elimination of drawbacks of drive systems less up-to-date, like jack-shaft and chains or double reduction axles, is an accomplishment of the Lippard-Stewart worm and gear—a mechanism famed for its great success abroad, and now accepted as the logical system of drive for commercial cars. Its saving of 7% to 12% of power transmitted to the rear wheels, its protection from dirt and grit, its great simplicity, its wearing qualities, its steady application of power, its absolute silence—all these characteristics are strong factors contributing to the Lippard-Stewart reputation for exceptional service.

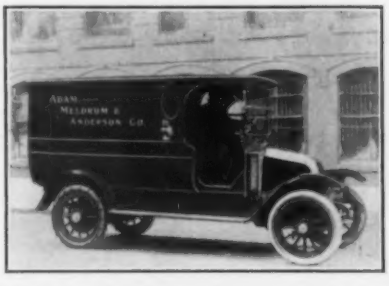


Trucks for Many Purposes

Lippard-Stewarts are built for either heavy loads or light delivery. Model F carries 1½ tons with an absence of effort and racking strains that is possible only with worm drive and liberal power. The truck of 1500 lbs. capacity has made an enviable record for itself in over 60 lines of trade. The use of either bevel drive (5 to 1 ratio) or worm drive (6 to 1 ratio) makes this model applicable to practically every operating condition.

Repeat orders and large installations by Hale Bros., San Francisco; Bon Marche, Seattle, Wash.; Boggs & Buhl, Pittsburgh, Pa.; Larkin Co., Buffalo; Parcel Post, Brooklyn; Rogers, Peet & Co., New York; Kolb Baking Co., Trenton, N. J.; H. S. Barney Co., Schenectady, N. Y., and many other firms of equally keen business judgment, are final endorsements of Lippard-Stewart trucks.

1½ ton chassis, worm drive, $2300; 1500 lb. chassis, bevel drive (pneumatic tires), $1650, worm drive (solid tires), $100 extra. Bodies for many uses.



Lippard-Stewart Motor Car Co.
1737 Elmwood Avenue
Buffalo, N. Y.

Steinmetz Says:

"I believe that the Electric will be the car of the future on account of its simplicity of operation and reliability. It is rare that it gets out of order. When it does so it is an accident—not as with the gasoline car, an incident. The man of moderate means cannot afford a horse and buggy because of the attention required. He will be able to afford an Electric Vehicle to take him to business because it requires no attention—if equipped with an *Edison* Battery. It often has to stand idle for several days and this is not good for a lead battery. I have tried to invent a lead battery that would not spoil, but gave it up."

Chas. P. Steinmetz

From an Approved Report of Some Extemporaneous Remarks of Dr. Chas. P. Steinmetz at a Recent Meeting of Engineers.

EDISON STORAGE BATTERY COMPANY

141 Lakeside Avenue, Orange, N. J.

The Edison Nickel-Iron-Alkaline Storage Battery is the **Only** One that Contains no Lead nor Acid

GMC
GASOLINE ELECTRIC
GENERAL MOTORS COMPANY
TRUCKS

CHASSIS
From 1¼ Tons at $1500
To 5 Tons at 2750

CHASSIS—LESS BATTERIES
From ½ Ton at $1200
To 6 Tons at 2500

Our new policy of lower prices and sane co-operation with owners has met with the approval of business men everywhere.

Since its announcement our increased volume of sales is convincing evidence that our new policy appeals to business men who like to do business on a basis that is fair alike to buyer and seller.

G M C trucks are of highest grade, both in material and workmanship—***they make good.***

We are able to sell better trucks at lower prices because of ***quantity*** production, and because all our sales are now cash sales. We make no trades for old trucks, and we do not sell on the installment plan.

We do not cut the price in one place to beat a competitor, and then make it up on the "easy" buyer.

Our prices are "laid on the table," and are the same everywhere—it's part of our fair and square business policy, and it wins. It's the only policy that will build a permanent business—and that is what we are doing.

When we reduced our prices it was a reduction to all—we have no secret prices.

We make a truck to fit ***your*** business—gasoline or electric. Ask for details.

Correspondence invited with dealers of financial responsibility

GENERAL MOTORS TRUCK COMPANY
PONTIAC **MICHIGAN**

Branches:—New York Boston Philadelphia Chicago Detroit St. Louis Kansas City

Take Cleveland, Ohio, for instance

The "Electric" Fleet of The Delivery Co., Cleveland, Ohio

Here is a photograph of a fleet of 25 electric delivery wagons and trucks which have recently been placed in service by The Delivery Company, of Cleveland, Ohio. Every "Electric" in this fleet is equipped with an "Ironclad-Exide" Battery.

During the month of November, 1913, which was the first month The Delivery Company operated, these trucks averaged 41 miles per day and carried an average of 181 packages per car per day.

The Cleveland Electric Illuminating Co. operates 4 "Electrics" equipped with "Ironclad-Exide" Batteries. Halle Bros., of Cleveland, have 8 electric vehicles equipped with "Ironclad-Exide" Batteries. The American Express Co., in Cleveland, uses 4 electric vehicles with "Ironclad-Exide" Batteries.

The following are other prominent companies in Cleveland using either "Exide", "Hycap-Exide", "Thin-Exide" or "Ironclad-Exide" Batteries.

Haas Bros.
Erner Electric Co.
Bigelow Fruit Co.
Strong, Carlisle & Hammond Co.
Union Paper & Twine Co.
Improved Cloth Sponging Co.
Higgins, Babcock & Hurd
Hall Van-Gorder Co.
Perfection Spring Co.
The May Company
Cleveland Laundry Co.
National Express Co.

Cleveland, a city where electric pleasure vehicles are extensively used, has thousands of "Electrics" equipped with various types of the "Exide" Battery—in fact, in Cleveland there are more "Electrics" equipped with "Exide" Batteries than all other makes put together.

Let us refer you to the owners of "Electrics" in your town who are using "Exide" Batteries, and let us help you in choosing the proper battery for your service.

THE ELECTRIC STORAGE BATTERY CO.

Manufacturer of The "Chloride Accumulator," The "Tudor Accumulator," The "Exide," "Hycap-Exide," "Thin-Exide," and "Ironclad-Exide" Batteries.

New York Boston Chicago **PHILADELPHIA, PA.** Denver San Francisco Seattle
St. Louis Cleveland Atlanta Detroit 1888-1914 Los Angeles Portland, Ore. Toronto
886 "Exide" Distributors 9 "Exide" Depots "Exide" Inspection Corps

"Little Giant"

New 4-Cylinder One-Ton Truck

Why Dealers Should Sell This Truck

You should sell the "Little Giant" because it possesses these important qualities which dealers should demand of the trucks they handle.

First—Correct design is required or it cannot do the work. The correctness of "Little Giant" design is proved by the work it ***is doing*** in actual service.

Second—Construction must be high class. The "Little Giant" is a product of the best materials and workmanship and fully qualifies in this respect.

Third—The truck should be economical to operate and maintain. This requires simplified construction and quality parts. The "Little Giant" has both and you can convince prospects they can save on cost as well as increase radius of operation.

Fourth—The maker should have ***established*** facilities for large production to insure a low price. Our plant is immense, our facilities complete, our production large.

Fifth—The producing company should have ample resources. The "Little Giant" is backed by an $11,000,000 corporation, 20 years experience and the good-will of 22,000 satisfied customers and amply able to redeem every promise and to fully co-operate with you.

Sixth—There should be a market for it. The "Little Giant" is of the most popular size, with great adaptability. The demand is shown by the tremendous sales of the past.

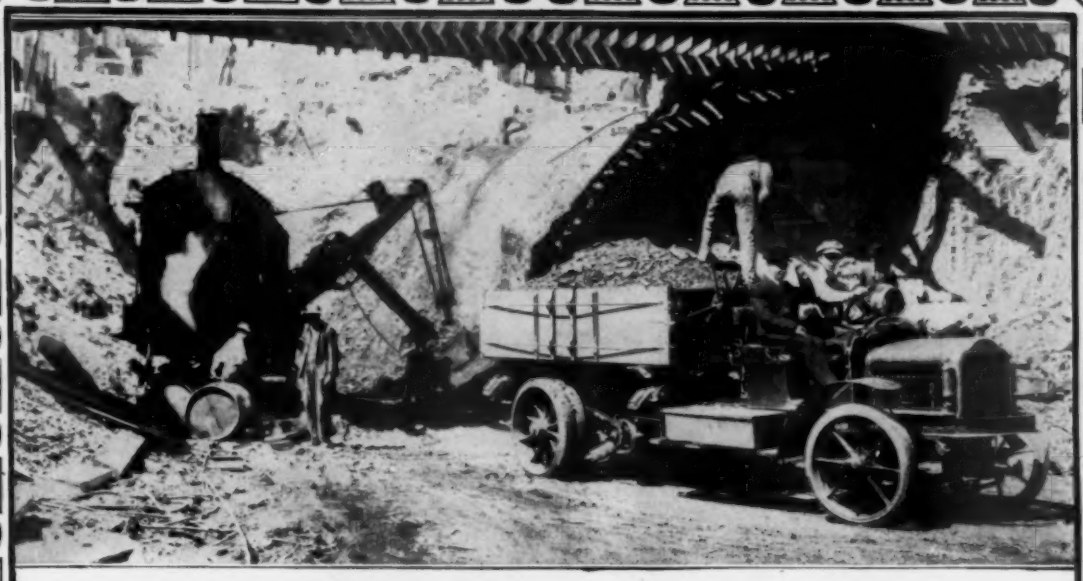
Thus the "Little Giant" qualifies in each essential. Each is an argument for you to handle it. In addition, one chassis means only a small investment and concentrated efforts. If you want to make money handling a dependable, efficient truck, write and see if your territory is open.

These condensed specifications show what you have to offer: 4-cylinder motor, 3¾" x 4½"; Holley carburetor; Thermo-syphon cooling system, special radiator; low-tension Kingston ignition; three-speed selective transmission; multiple-disc clutch; left drive; center control; 110 inch wheelbase; two sets of brakes, etc.

Write us today for fuller details.

CHICAGO PNEUMATIC TOOL COMPANY

1031 Fisher Building, Chicago **Branches Everywhere** **50 Church Street, New York**



Re-making San Francisco—

This 5-ton White Truck, owned by Ralph Blass, is hauling material from the excavation at Stockton Street Tunnel under one of San Francisco's large hills. It is equipped with

GOODRICH
WIRELESS
TRUCK TIRES

Although this is a gruelling test for the tires, they are standing the "grind" and have already delivered over 6000 miles. The contractor is getting the "Continuous Service" for which Goodrich Wireless Tires have become the Standard.

What Goodrich Wireless Tires are doing for Mr. Blass, they will do for you

The B. F. Goodrich Company

Factories: Akron, Ohio **Branches in All Principal Cities**

When Writing, Please Say—"Saw Your Ad. in the C C J"

DeKalb Trucks

DELIVERERS OF REAL SERVICE

Trucks That Are Business Builders for Dealers

The continued success of a dealer who hustles is more dependent upon the service given by the first trucks he sells than upon any other factor.

The eyes of competitors and prospects as well as the purchaser himself are ever on those trucks, and any failure to make good is noted and the trucks condemned.

Many a hope of a highly prosperous agency has been blasted because the trucks wouldn't stand up or the concern producing them wouldn't live up to its promises.

The dealer handling the **DeKalb** runs no such risks. The truck is built to give real service—efficient, economical and lasting—and the price was made as low as was consistent with the quality of the truck.

The first sale but paves the way for others. Each truck will soon earn a reputation for giving service that will be more convincing than tons of printed matter. The records being made by DeKalb in your own locality will be your strongest selling argument, and every truck on the street will be a business builder for you.

These brief specifications tell in part why the DeKalb makes good—Timken Axles, front and rear; Continental Motor; Bosch Magneto; Stromberg Carburetor; Pressed-Steel Frame; Three-Point Suspension on Motor and Transmission; Selective Sliding-Gear Transmission; Non-Reversible Worm-gear Steering Gear; Left Drive; Center Control; Two Ton Capacity; Special Type Cone Clutch, etc.

The DeKalb is the truck for you if you want to handle a high-class, heavy-duty truck, correctly designed and built, of unquestioned worth and backed up by a company of long standing, financial responsibility and unblemished reputation.

Good Territory Open----More Dealers Wanted

Write today for territory, terms and complete specifications

DeKALB WAGON CO. : DeKalb, Illinois

CHICAGO SALES OFFICE, 1532 MICHIGAN AVENUE

When Writing, Please Say—"Saw Your Ad. in the C C J"

1600 to 2000 lbs. Capacity

Flint

Chassis Prices: Solid Tires, $1285; Pneumatic, $1370

$80 to $175 additional for bodies, according to type

As a business man who demands one hundred cents worth of value for every dollar spent, we offer you the FLINT Motor Delivery Wagon. Mechanically and scientifically, it is as perfect as the highest grade of engineering brains can make it. It is built with loading space scientifically designed to fit *your* business. Four-fifths of the over-all length of this wagon is correctly constructed loading space.

MR. DEALER:

If you are in business for steady, consistent growth—for permanent, legitimate profits—you'll find the FLINT exactly the commercial car you'll enjoy selling. It's as good a car in its class as any that travel the roads today.

Desirable Territory Still Open. WRITE US TODAY

Flint Motor Wagon Department

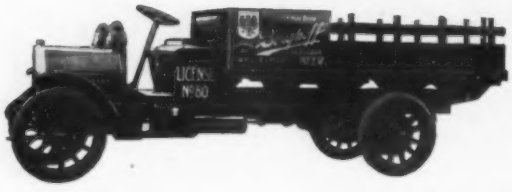
DURANT-DORT CARRIAGE CO.

FLINT, MICHIGAN

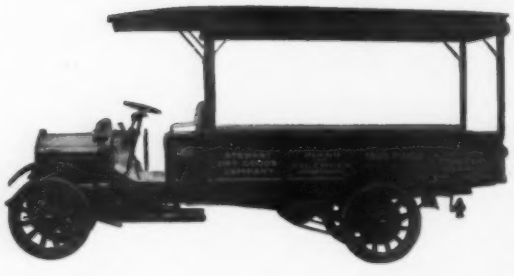
Flint

What Is Your Proposition to Dealers?

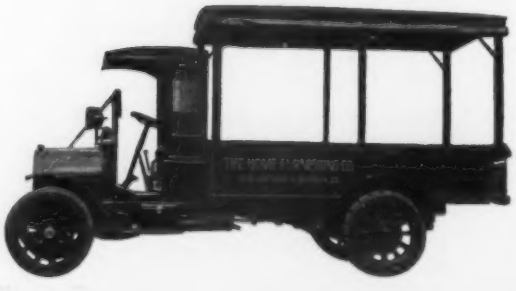
Standard Highland Bodies For Motor Trucks



Highland Bodies are standard for motor trucks because they have proved to be the best from the standpoints of efficiency and durability; because they are made, not by wagon builders, but by engineers who know the severe service motor truck bodies must withstand and design accordingly; because by standardization we have not only made better bodies, but reduced the cost below those distinctly inferior; because they have proved superior from every practical standpoint.



Our production facilities are so ample and complete that you can not only procure the most desirable body in the quickest time and at the lowest cost, but the wide range of types enables the car builder to procure from this line the right body for every business. We make 38 sizes of Flare Board and 27 sizes of Stake Bodies in addition to Furniture and various other types of bodies



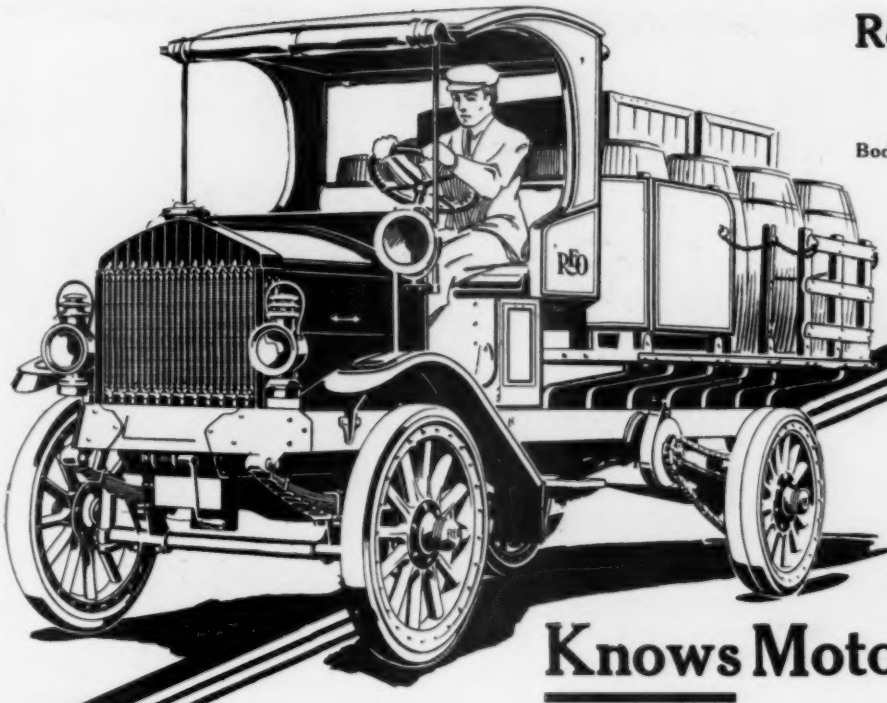
For Economy, Service and Durability Get

Highland Bodies

Our Catalogue and Price List Should Be With You Always

The Highland Body Mfg. Co.

Cincinnati **Ohio**



Reo Model J Truck

$1650
F.O.B. Lansing

Body Extra Capacity, 2 Tons

For the Man Who Knows Motor Trucks

There is no one so well able to realize the striking advances in motor truck design embodied in the Reo Model J Two-Ton Truck, as the man who has already studied and used other motor trucks.

Here you will be at once struck with the way strength has been obtained without too much weight, perfect mechanical operation and control with a minimum of working parts, and a total elimination of all mechanical features of a delicate or uncertain nature, whose failure to operate would result in loss of time and service.

Here are some of the features that mark the Reo as the most advanced type of medium heavy-duty motor truck now on the market: Reo Sectional Radiator, of 24 separate interchangeable units, may be repaired on the road anywhere; motor, clutch and transmission are cushioned on a sub-frame, away from jars and road-shocks; left-side drive, and the best and handiest center control ever brought out; big armored front frame; demountable driver's cab; gas headlights and Prest-O-Lite tank, and many other details of design and construction that mark the utmost advance in modern engineering practice.

These features mean sure, unbroken service, low upkeep cost, and that wide margin of safety that a motor truck must have to meet the frequent emergencies of extra service, bad roads and overloading, that cannot be otherwise forestalled.

While 54 competing makes of trucks average in price $2701, this Reo Model J Truck sells for only $1650, chassis with driver's cab—a figure that is possible only with a great and thoroughly experienced organization like the REO.

Why Truck Dealers Want the Reo

The Reo is the logical motor truck for the enterprising dealer who is looking for *volume* of sales—for the man who is not satisfied with only an occasional truck sale, but wants a business that will grow from month to month, and from year to year, with every truck he sells an active sales promoter for others.

For such a dealer we have an interesting message. We not only have the truck, but the organization to back his efforts in a way that insures success. If you want to sell more and better trucks, today is the time to write us.

YOU CAN DO IT WITH A REO

For Complete Information Write

Reo Motor Truck Company

Manufacturers

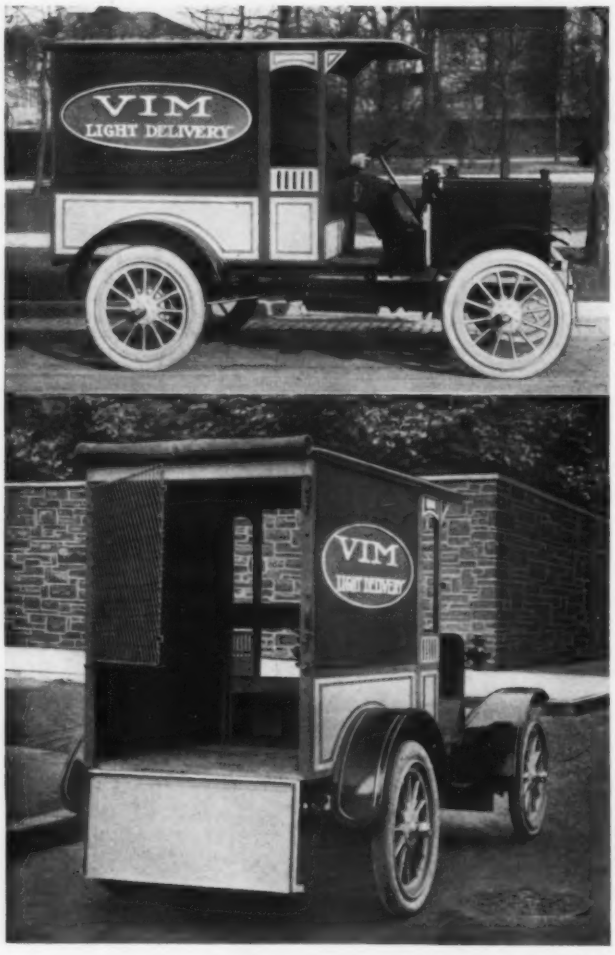
Lansing, Michigan

When Writing, Please Say—"Saw Your Ad. in the C C J"

VIM LIGHT DELIVERY

Low in Price — High in Quality

This is the Answer to the Widespread Demand for a "Commercial Ford"



Qualifying for Abuses Attending Commercial Service

15-20 H. P. (4-cylinder) Northway Truck Motor
35 H. P. Northway Cone Clutch
35 H. P. Northway Transmission
30 H. P. Rear Axle (Brown-Lipe Differential)
Electrically Welded Seamless Steel Body

From the village merchant to the Department Store every business house is a good prospect.

The Vim is destined to be to the motor truck world what the Ford is to the pleasure car business.

An authorized increase of $400,000 in capital and new equipment devoted entirely to production of Vim Cars, guarantees dealers satisfactory deliveries.

Completely equipped, including a substantial storm front, drop curtain back of front seat, heavy screen with substantial locks over tailboard, heavy-hinged tailboard with inside locks.

$635
F. O. B. Philadelphia

An Epoch-Marking Car for Both Dealer and User

Merchants everywhere are demanding a small, strong, light, low-priced commercial car. The Vim is the only car to meet this demand. Dealers recognize that the field is great and that competition is not keen. Not only is the Vim right in price, but it is well designed and made to last.

VIM SPECIFICATIONS

Engine—Northway light truck motor, 3" bore, 4½" stroke, four cylinders, water cooled thermo-syphon mechanically operated valves enclosed. Motor cast enbloc; crank shaft diameter 2"; three main bearings.

Horse Power—15-20.

Clutch—Leather-faced cone, 12" diameter, 2½" face; designed for 30 h. p. loading, thus qualifying for abuses attending commercial service.

Transmission—Three-speed and reverse selective sliding gears, ¾" face, six and eight pitch; shafts all of chrome nickel alloy, mounted on imported annular bearings, mounted as unit with motor.

Lubrication—Positive force feed and splash; capacity 2 gallons, sufficient for 500 miles.

Ignition—Atwater Kent Multi-Sparker, enabling easy starting and economy.

Control—Left-hand drive, right-hand control for gear shift and emergency brake.

Brakes—Contracting on rear wheel drums for service, internal expanding on rear wheel drums for emergency; 10" diameter, 2¼" wide and Raybestos-faced. Both brakes equalized.

Axles—Front axle special drop forged steel in one-piece, I-beam section; knuckles and steering arms are drop forged and heat-treated. Rear axle full floating, equipped with Brown-Lipe differential of alloy steel; drive shaft 1 1-8" diameter.

Wheels—12 spoke, 1¼" size of spoke, Schwarz Artillery wheels, equipped with rims for 30 x 3 and 3½ tires.

Wheelbase—80", tread 56", angle of steering 35°.

Gasoline Tank—Located under seat; 7 gallon capacity; conveniently arranged for filling.

Springs—Semi-elliptic front and rear; special heat-treated steel, 2" wide.

Weight—1575 pounds.

Body—Steel body, all joints welded, providing an endless steel frame without joints whatsoever, making the most substantial body to build. Inside loading measurements, 56" long, 54" high, 42" wide.

Finish—French Gray with Monitor Gray mouldings.

Speed—2 to 25 miles per hour.

Frame—Pressed steel channel, depth, 3½".

DEALERS: Your Territory May Still Be Open

THE TOURAINE COMPANY, FACTORY, Broad and Huntingdon Sts., **Philadelphia, Pa.**
MAKERS OF THE TOURAINE SIX PLEASURE CARS

REPUBLIC TRUCKS
INSURE SERVICE

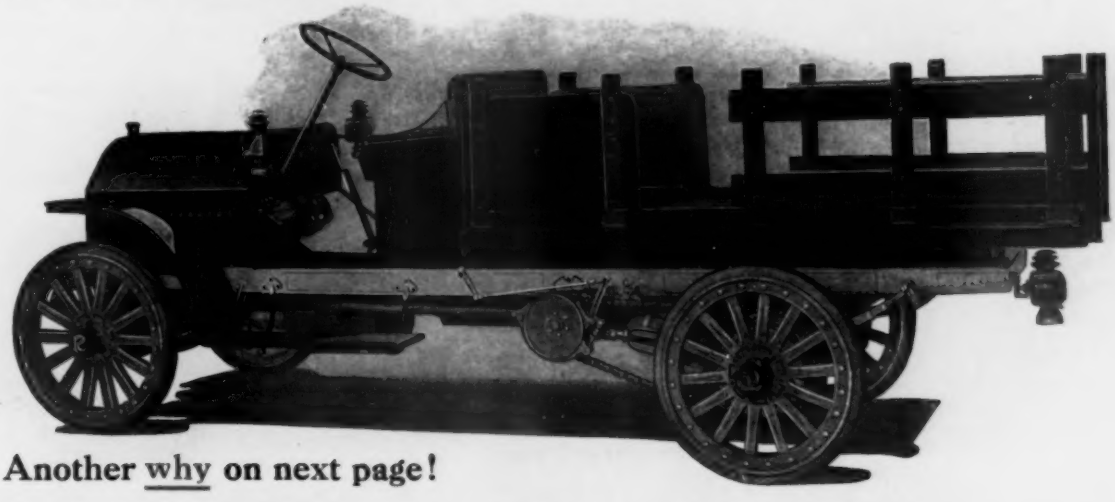
Why? did the
Republic One-Ton Truck
find such immediate sale and response from dealers?

One Model

Concentrating all our efforts on one model and putting forth every endeavor to make that one the very best of its kind and the greatest value obtainable, resulted in the production of a truck whose extraordinary salability was instantly recognized by dealers.

Making only one model meant that we must make that one of unquestioned worth or we could not hope to interest either dealer or consumer to any extent. Therefore, no stone was left unturned to make this unrivaled in its field. How well we succeeded is shown by the immediate response from dealers all over the country.

Only one model, and that the most popular size, meant that dealers could meet nearly every requirement, except very heavy duty, with that type. Hence, his investment was light while its adaptability was great,—a point of great importance to dealers.



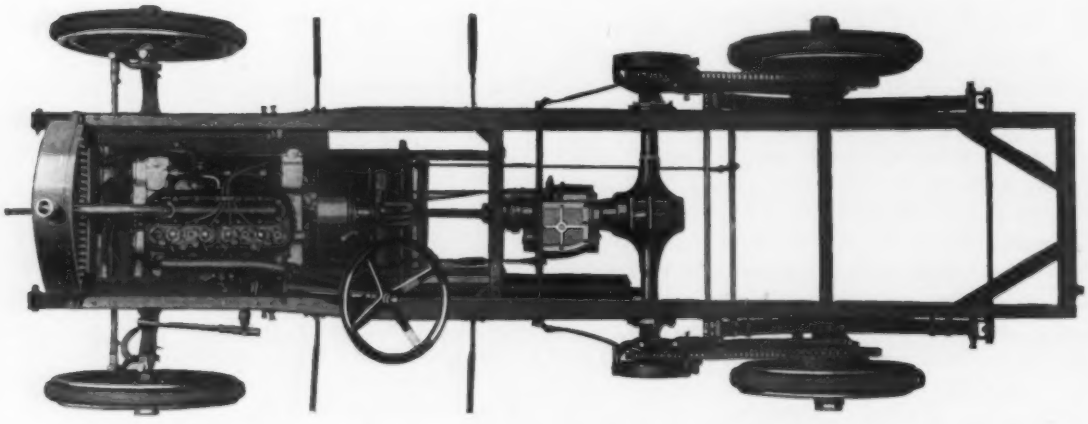
Another why on next page!

Alma Motor Truck Company
Alma, Michigan
General Sales Office: 880 Woodward Ave., Detroit, Michigan

REPUBLIC TRUCKS
INSURE SERVICE

Why?

Construction and Specifications



In building the REPUBLIC nothing was permitted to enter into its construction which was not of proved worth. Every unit is made by a specialist who is recognized as foremost in his field. It is a standard truck, built of standard parts, made by standard makers, and because of this, it sets a standard of service which is rarely attained by other trucks.

Not only were standard parts used, but in many cases they were identical with those used in the most successful 1½ to 2 ton trucks on the market, possessing a strength and efficiency rarely found in trucks of its capacity.

The quality of the REPUBLIC is indicated by the following—

Brief Specifications:

Continental Motor
Schebler Carburetor
Eisemann Magneto
Russel Jack Shaft

Hyatt Roller Bearings
Hartford Type Joints and Clutch
Culver-Taylor Chains

Covert Transmission
Lewis Springs
Left-Hand Drive
Center Control

Alma Motor Truck Company
Alma, Michigan
General Sales Office: 880 Woodward Ave., Detroit, Michigan

REPUBLIC TRUCKS
INSURE SERVICE

Why?

The Price—$1350.00
(Chassis)

How can we build a truck of this calibre and sell it at such a low cost is a question we are constantly asked.

The fact that parts such as are used in the REPUBLIC are found in high-priced trucks and rarely in trucks of this capacity and are virtually unheard of at this price, makes the REPUBLIC a source of amazement to dealer and user.

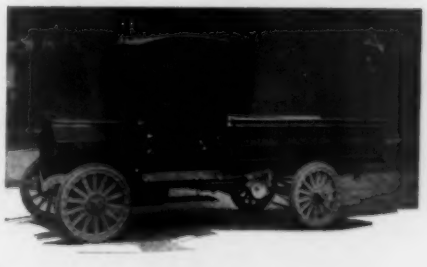
How can we do it? Well, here's the reason—production facilities. By building in large quantities we are able to buy advantageously. By using quality parts we can figure close on the allowances for replacing defective parts, as we know there will be few replacements to make.

The benefit of both these factors of price reduction are passed on to the user. These, and the fact that we content ourselves with a modest profit, enable us to offer a truck of the highest quality at a price far below what such quality usually commands.

Dealers have instantly recognized the great opportunity offered by selling such high quality at such a low price.

Users have realized the advantages of buying a truck of known worth and standard parts at a price less than mediocracy brings.

The result is a phenomenal sale of the REPUBLIC.



Alma Motor Truck Company
Alma, Michigan
General Sales Office: 880 Woodward Ave., Detroit, Michigan

REPUBLIC TRUCKS
INSURE SERVICE

To Dealers:—

Why not get into the Republic family of successful dealers?

The first announcement of the REPUBLIC TRUCK brought a flood of letters from keen dealers all over the country who sensed a really great opportunity.

Each succeeding announcement has brought its quota of inquiries from dealers who want to know more about this great value-giving truck.

A good share of these inquirers have lost no time in taking agencies. They are making money, because it is easy to prove the worth of the REPUBLIC.

They have an advantage over competitors in being able to offer more known value for the money than others. They sell a truck that emphatically makes good, and a reputation like that soon creates business. They are successful, because they handle a truck that makes success a virtual certainty.

Although we have established many agencies, the country is large and there is still some very desirable territory open. There is an opportunity in many cities for dealers to establish a very profitable agency.

How about your town? If the REPUBLIC is not represented there, opportunity is beckoning to you. It is simply justice to yourself to learn what our selling proposition offers you. Write us about it and put it up to us to show you wherein the REPUBLIC is the truck for you to sell.

Alma Motor Truck Company
Alma, Michigan
General Sales Office: 880 Woodward Ave., Detroit, Michigan

Why 400,000 cars are equipped with the J-M (MEZGER) SOOT-PROOF SPARK PLUG

When 400,000 car owners choose this plug in preference to all others, **there must be a reason!** And here it is, in a nutshell.

This is the **only plug that can't short-circuit**—because it is the only plug that is absolutely soot-proof.

It is impossible for soot to collect at the firing point, as the intense heat of the porcelain "petticoat" burns up the carbon as fast as it is formed. This is due to the fact that the "petticoat" extends to the end of the outer shell, where it is exposed to the heat of combustion.

We control the basic patents for this form of construction.

The porcelain used in this plug is not affected by sudden changes of temperature. It is made of special clays tempered by a process of our own.

Millions of J-M (Mezger) Soot-Proof Plugs have been sold since they were put on the market, over 12 years ago.

If any "J-M" (Mezger) Soot-Proof Plug fails to give satisfactory service we will replace it with a new one. Order from your dealer. Shipped direct from our nearest Branch if not at your dealer's. Price $1.00.

Write Nearest Branch for Booklet

JOHNS-MANVILLE SERVICE COVERS THE CONTINENT

H. W. JOHNS-MANVILLE CO.

Albany Buffalo Cleveland Indianapolis Louisville New Orleans Philadelphia Seattle
Baltimore Chicago Dallas Kansas City Milwaukee New York Pittsburgh St. Louis
Boston Cincinnati Detroit Los Angeles Minneapolis Omaha San Francisco Syracuse

THE CANADIAN H. W. JOHNS-MANVILLE CO., LIMITED: Toronto Montreal Winnipeg Vancouver 2115

Worm and Wheel Story

England, the home of worm drive, gives the best evidence of its value for trucks. At the last Commercial Car Show, held in July, in London, the following list tells its own story:

(EMBRACING ALL THE BIG MAKERS)

Worm-driven models	**21**
Chain-driven models	**12**
Bevel-driven models	**6**

Being familiar with its great power and efficiency, the English makers have adopted it.

The man who has made the worm drive a success in England is now with us.

Give us the horse power of your car, approximate speed of the driving shaft, ratio required and the approximate weight of the machine, and let us send you a blue print of what we would recommend.

Why experiment with experimenters?

The Cleveland Worm and Gear Co.

988-992 East 67th Street **CLEVELAND, OHIO**

It is Genuine Economy to Equip Your Trucks With

Piston Rings

They'll conserve your power, cause your engine to convert every particle of gas into explosive force, eliminate much of the carbonization that is now taking place in your cylinders and enable you to get a greater mileage from a gallon of gasoline than you can possibly get using ordinary piston rings.

Surely these points are of sufficiently great importance to you and your expense of operation to cause you to stop and learn why the slightly greater cost of Leak-Proof rings becomes a great ultimate economy.

The explanation is simple and convincing. The ordinary piston ring seldom has good bearing on cylinder walls and always has a gap through which gas can escape and oil work up. That means loss of power and increased carbonization.

Leak-Proof rings are made in two pieces. Each piece bears a right-angle flange, which strengthens the ring and insures perfect bearing on cylinder walls; also covers the opening in the other piece. Thus when assembled and put in place the ring presents an impenetrable barrier to the gas which seeks to escape. This results in perfect compression, full power, and a material saving of gasoline to cover any given mileage.

Nearly 200,000 motorists and truck owners have proved the truth of this statement. If you are open to conviction and really want to economize in cost of operation send for our literature and then

"ASK THE USER"

Any one of them will give willing testimony to the advantages of using Leak-Proof Piston Rings.

McQuay-Norris Mfg. Co.

DEPT. "C"

St. Louis, Missouri

BRANCH OFFICES:

NEW YORK, N. Y.—Room 53, Lincoln Square Court, 64th & Broadway.

CHICAGO, ILL. — Suite 39, Merchants Building, 106 N. LaSalle Street.

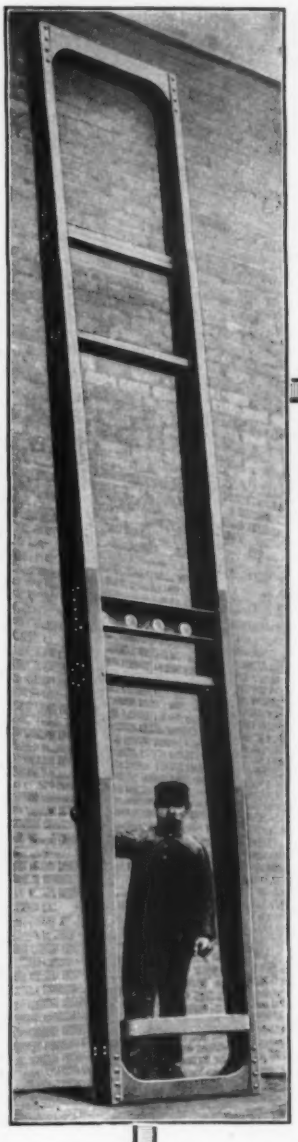
SAN FRANCISCO, CAL.—268 Market Street.

PITTSBURGH, PA. — 7620 Tioga Street.

KANSAS CITY, MO. — 3123 Michigan Avenue.

LOS ANGELES, CAL. — 822 Central Building, 6th & Main Streets.

CANADA—W. H. Banfield & Sons, 120 Adelaide Street, W., Toronto.



FRAMES

For Pleasure Cars
Commercial Cars
Trucks

1/2 ton to
10 ton

Prestige

"A man is known by the company he keeps."

In the same way the car which rides on a frame built by the

Hydraulic Pressed Steel Company

gains, in the buyer's eyes, the firmly established reputation for quality and leadership that goes with the **"Hydraulic"** name. **Hydraulic Frames** are silent guarantees of quality.

The Hydraulic Pressed Steel Co.

3152 East 61st St.
Cleveland, Ohio

Locates the Cause of High Trucking Costs

No need to ride on the truck to determine a driver's efficiency. An absolutely just record—a more exact report of each man's performance than could be turned in by a trained observer sitting all day at his side—is furnished automatically by the

Jones Recorder

A marking needle, driven direct from the road wheel by flexible shaft and gears, leaves a constant record, covering every minute of the twenty-four hours, on a chart controlled by clockwork. It shows at a glance the starting time, stopping time, duration of each stop, mileage between stops, and speed at all times. It shows just where loss of time occurs and paves the way for its prevention. It provides a means for arriving at an absolutely accurate cost unit for figuring maintenance expense. The chart is changed daily. The record is made in a locked case and cannot be tampered with. You or your trusted employee hold the key.

Two Styles

Recorder alone in heavy closed case, price $65.

Same with 30 mile Speedometer and Odometer with 100,000 mile season mileage and 100 mile trip mileage, instantaneous trip reset, price $85.

H. W. JOHNS-MANVILLE CO.

Brake Lining, Spark Plugs, Electric Lamps, Speedometers, Horns, Fire Extinguishers, Carburetors, Dry Batteries, Vaporizers, Auto Locks, Fuses, Tapes, Packings, Etc.

Akron	Detroit	Omaha
Albany	Duluth	Philadelphia
Atlanta	Galveston	Pittsburgh
Baltimore	Houghton	Portland, Ore.
Birmingham	Houston	Rochester
Boston	Indianapolis	St. Louis
Buffalo	Kansas City	St. Paul
Charlotte	Los Angeles	Salt Lake City
Chicago	Louisville	San Francisco
Cincinnati	Memphis	Seattle
Cleveland	Milwaukee	Syracuse
Columbus	Minneapolis	Toledo
Dallas	Newark, N. J.	Washington
Dayton	New Orleans	Wilkes-Barre
Denver	New York	Youngstown

2321

Pyrene

TRADE MARK

FIRE EXTINGUISHER

SAVES 15%

In Your Fire Insurance Premiums

Now Is the Time to Equip YOUR Car

The Pyrene Extinguisher is convenient in size, has the maximum of efficiency, is easily operated, presents a handsome appearance, and Pyrene brass and nickel-plated extinguishers are the only types that qualify to pay part of your insurance.

Once knowing the value and true economy of the Pyrene Extinguisher, every careful motorist will make it a standard part of his car's equipment—because Pyrene protects his life, as well as his investment—provides safety for his garage, and obtains for him a substantial insurance reduction.

For reduction in fire insurance rate, consult agents of The Aetna Accident and Liability Co., and the Automobile Insurance Co. of Hartford, Conn.,—or ask your own broker.

Write for booklet—proving the economy, efficiency and supremacy of Pyrene—Send postal to-day to nearest branch office.

Brass and Nickel-Plated Pyrene Fire Extinguishers are the only one-quart fire extinguishers included in the lists of approved Fire Appliances issued by the National Board of Fire Underwriters.

Pyrene Manufacturing Co., 1358 Broadway, New York

Alton	Cincinnati	Louisville	Philadelphia
Atlanta	Cleveland	Memphis	Pittsburgh
Baltimore	Dayton	Milwaukee	Richmond
Bridgeport	Denver	New Orleans	St. Louis
Boston	Detroit	Norfolk	St. Paul
Buffalo	Duluth	Oklahoma City	Salt Lake City
Chicago	Jacksonville	Phoenix	San Antonio
			York, Neb.

Pacific Coast Distributors: Gorham Fire Apparatus Co.
San Francisco Los Angeles Seattle

Distributors for Great Britain and the Continent:
The Pyrene Co., 29A Charing Cross Road, London, W. C.

LAVIGNE
Steering Gears

Equip your product with dependable Steering Gears. Get the best — Lavigne

THESE are the standard for Commercial Cars, Trucks, Tractors and High-Grade Pleasure Cars. Their quality is so high and their service records so good that we make more steering gears for Commercial Cars than any other manufacturer.

They are made in every size to meet every requirement and are furnished with drag links.

We specialize in heavy gears for motor fire apparatus.

Our prices are right and we make prompt shipments.

WRITE FOR BLUE PRINTS

THE LAVIGNE GEAR CO.
Station A RACINE, WIS.

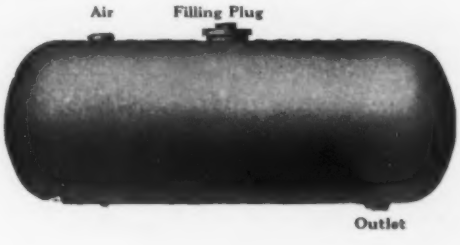
Seamless Steel Tanks

Guaranteed against leakage for two years and practically indestructible

Truck Manufacturers:

How can you afford to use on your trucks, with the hard service they get, anything but Federal Pressed Steel, ***seamless guaranteed*** tanks?

Think of the leakage possibility of a riveted tank in comparison. Think what your tank replacements cost last year. Think what an added sales argument for your product a guaranteed, seamless Federal tank will be. Then write us for quotations on your requirements.



WE ALSO PRODUCE

HEAVY FLANGES AND BRAKE DRUMS

of Any Diameter, Gauge or Height

Federal Pressed Steel Company Milwaukee, Wis.

HESS-BRIGHT
Ball Bearings

Careful study and consideration of the requirements demanded of bearings for commercial vehicle service inevitably point to the use of HESS-BRIGHT Ball Bearings, because in grueling tests of service they have proved their superiority, longer life and greater utility. This is the result of the thoroughness and accuracy of manufacture which place them in a class by themselves.

HESS-BRIGHT Ball Bearings on your truck assure the utmost efficiency and value so far as those elements are controlled by the bearings.

THE HESS-BRIGHT MANUFACTURING CO.

Main Office and Plant No. 2 on New York Division of Penna. R. R., Front Street and Erie Avenue, Philadelphia, Pa.

Stores for Retail Distribution:

Philadelphia, 666 N. Broad Street — New York, 1974 Broadway — Chicago, 1800 Michigan Avenue

POLACK
TYRES
INSURE TRUCK SERVICE

Experienced users keep their trucks continually in service by applying Polack European Standard tyres exclusively. Guaranteed for 10,000 miles and invariably run more.

RESILIENT EFFICIENT ECONOMICAL

POLACK TYRE & RUBBER CO.

246 W. 59th Street, New York

Albany, Baltimore, Boston, Chicago, Cleveland, Dayton, Detroit, Kansas City, Montreal, Newark, New Haven, Philadelphia, Providence, St. Louis, Washington

Factory: Bridgeport, Conn.

POWER to move all trains through the Detroit River Tunnel comes from the largest storage battery plant of its kind in existence. The

Gould Storage Battery

used exclusively throughout has given excellent satisfaction. Likewise, the Gould Battery for vehicle propulsion has maintained supremacy through our desire and ability to build the best.

Our vehicle types are made as carefully as the batteries we furnish for driving rush hour trains in the Grand Central Terminal, New York, for driving New York street cars, for driving submarine naval vessels, for firing big guns of the army and navy, for lighting trains on all prominent American railroads, etc.

If you want the best that exists in storage batteries and you appreciate liberal treatment, try the Gould Battery. (Our renewal plates fit jars of any make.) Our engineering advice is yours for the asking.

Gould Storage Battery Co.

General Offices: 30 East 42nd Street, New York

Boston, 14 Cambria Street — Detroit, Boyer Bldg.
Philadelphia, 613 Betz Bldg. — Chicago, The Rookery
Cleveland, Amer. Trust Bldg. — San Francisco, 904 Rialto Bldg.

WORKS: Depew, N. Y.

Agents: WASHINGTON, KANSAS CITY, DENVER, TOPEKA, LOS ANGELES, SEATTLE

Canadian Representative: R. E. T. PRINGLE
Montreal Toronto Winnipeg Vancouver

Full stock carried at all cities where we have offices or agents

91

There Is Good Territory Open for the Sale of

CROCE
MOTOR TRUCKS

¾, 1, 2 and 3 Ton Trucks

Dealers who are desirous of handling a high-class truck of proved ability that justifies strong arguments, gives complete satisfaction and builds up a business, are invited to investigate the CROCE. It will be found to excel in these very essential factors—quality, economy, efficiency, durability and value.

Consider these points for a moment:

QUALITY—that is proved by the parts used, such as Timken Axles, Wisconsin Motors, Spicer Universal Joints, Schwarz Wheels, Kells Radiator, Bosch Magneto, Brown-Lipe Transmission, Schebler Carburetor, and other equally high-class parts.

ECONOMY—The CROCE distinctive design causes the weight to be one-fourth less than other trucks of similar capacity. This saves enormously on tires and gasoline and makes operation very economical.

EFFICIENCY—In every line of business in which it has been used it has made good. The best proof of this is the fact that we get repeat orders from nearly every customer.

DURABILITY—The CROCE is built so well that it gives long-continued and satisfactory service. The first CROCE built is still in active service after years of usage. The construction is such that every buyer has the right to expect a similar record.

VALUE—There is full value for every dollar in CROCE trucks, and in the long run they are much cheaper than those whose first cost is less.

If these qualities appeal to you as being what you and your trade want, write us for complete descriptions, territory, terms, etc.

CROCE AUTOMOBILE CO.
ASBURY PARK, N. J.

A Strong Plug for Heavy Work

You can't expect a brittle Spark Plug to stand the strain and jars of your motor truck. Plugs insulated with porcelain, mica, etc. are bound to break.

HERZ PLUG

"Bougie Mercedes"

is an exquisite combination of STONE and STEEL. It is made to stand up, and it does. Its insulation is

Double Unbreakable Stone

It is Blue Enameled. HERZ PLUG has Four Sparking Points of Platinum-Alloy, which ensure a fat, hot spark at all times. It is Self-Cleaning and

Guaranteed a Full Year

HERZ & CO., 245 W. 55th St., New York

Makers of the HERZ MAGNETO

The Force of Advertising

a practical reliable truck to the consumer is being felt by Selden Dealers all over the country. Every prospective buyer of trucks will know that

$500 will put the $2000 Selden Truck into Service

and that the truck itself will earn the remaining monthly payments of $125 each. Actual comparison part for part will prove that the Selden is stronger than any other 3000 lb. truck on the market.

This extra strength assures durability, long life and a great future saving in maintenance and repairs. It puts service into the truck itself.

We want Dealers in Unassigned Territory who "Know how" to sell trucks and who appreciate the business opportunity offered by the Selden Truck plus the Selden Sales Plan. Write today telling about your facilities and experience.

Selden Truck Sales Co., 402 East Ave., Rochester, N. Y.

USE KEROSENE

CUT YOUR FUEL EXPENSE IN HALF

WITH THE

G. C. VAPORIZER

It **runs any motor on kerosene** and the cheaper fuels **better** than on gasoline, and operates **without carbon, odor** or **smoke.**

Every truck owner and user should learn all about this extraordinary motor improvement by sending for our booklet,

"Use Kerosene as Fuel"

G. C. Vaporizer Company of America, Inc.

1790 BROADWAY NEW YORK

COTTA TRANSMISSIONS

Internal View of Shaft-Drive Transmission, designed for use in worm-drive trucks

For Heavy Truck and Tractor Service

Eliminate Transmission Trouble

Selective type, individual clutch system. All gears always in mesh. Countershaft and mainshaft gears idle on direct. Improved speed-changing device. No plain bearings —loose gears mounted on roller bearings.

Write for Bulletin

COTTA TRANSMISSION CO.

814 So. Main Street Rockford, Illinois

A Live Selling Proposition

is awaiting good dealers in unassigned territory. Write us today about handling the

2000-Pound PALMER 3000-Pound
The Standardized Truck

Every part built by a specialist, in a gigantic factory devoted to that part alone.

PALMERS FOR EVERY PURPOSE

Palmer 2000-Pound, **$1600**; 3000-Pound (carrying capacity up 2 tons), **$2000**.

Write For Literature

PALMER-MEYER MOTOR CAR CO.
5027-35 McKissock Avenue, St. Louis, Mo.

The
Motsinger
Carburetor

on a motor car or truck avoids the delay caused by fussing with the many adjustments of the ordinary curburetor.

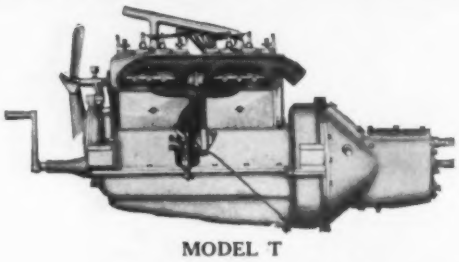
It is simple—ready when installed.

No changing springs, needles or nozzles. The one adjustment is on the steering post.

Put one on your car or truck

Motsinger
Device Mfg. Co.
964 Miami St.
LAFAYETTE INDIANA

KERMATH



MODEL T

UNIT POWER PLANTS

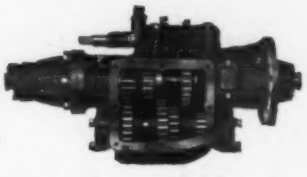
KERMATH AUTOMOBILE MOTORS and Unit Power Plants embody nothing but the best and most conservative design known to the automobile trade today. There is nothing new, freakish or radical about any part of the engine, clutch or transmission. We have endeavored to produce a power plant along standard lines by making same one size, one type only. By devoting our entire efforts to this one type in the refinements of all its details, we are able to give the manufacturer as good a power plant as can be produced on a given size and type, and to do so at a reasonable price. *Write for circular and complete specifications.*

Kermath Manufacturing Co.
Detroit, Michigan

COVERT

THE PROVEN TRANSMISSION

14 Years of Satisfaction



Years of unequaled service to users of Covert Transmissions has proven the superiority of Covert construction.

Designed right—built right—by men who know.

Made in sizes suitable for commercial vehicles from 500 lbs. to 10,000 lbs. capacity.

Covert Motor Vehicle Co.

SALES OFFICE
Detroit, Mich.

FACTORY
Lockport, N. Y.

SIXTY-TWO different manufacturers are now specifying LONG cooling systems.

We have been able to furnish them with exactly the system they wanted and needed.

Our modern factory with its efficient crimping, punching, bending and stamping machinery makes our product **uniformly good.**

We make all kinds of cooling systems — cellular, honeycomb, spiral tube types, for all kinds of cars, trucks and tractors.

Also hoods, radiators and accessory fittings.

We guarantee to solve your cooling problems.

Let our Engineering Department help you.

Long Manufacturing Co.
Detroit Michigan

LONG

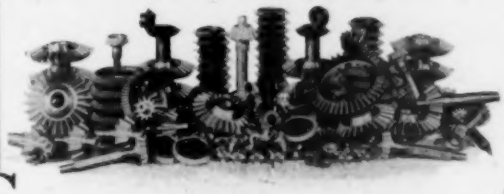
NON-GRAN **has proved** its MERIT—its UNIFORMITY—its absolute SUPERIORITY to every other bearing metal, in every duty for which it has been recommended. Constantly increasing numbers of car manufacturers and repair men are realizing the wisdom of backing their workmanship with the best bearing metal to be had. That is why NON-GRAN has reached such wide use.

HIGH SPEED NON-GRAN BEARING BRONZES

The use of NON-GRAN in a car is not only an **indication** of quality, but conclusive proof that the car WILL STAND UP. The BEARINGS are the parts that take the WEAR.

AMERICAN BRONZE COMPANY
340-380 Chester Boulevard BERWYN, PENNA.

—GEARS—



GEARS GEARS

Bevels Mitres Worms
Spurs Spirals Racks
Sprockets

We produce in quantities to specification cut and planed Gears and Pinions of all descriptions. As a source of supply in connection with *Gears* and *Gear Cutting*, we are considered an asset by many of the best interests. They buy from us year after year, because these advantages are afforded:

(1) *Unexcelled facilities.*
(2) *The highest standard of workmanship.*
(3) *Years of experience as specialists in gearing.*
(4) *A most careful selection of materials.*
(5) *Particular attention to deliveries.*

THE VAN DORN & DUTTON CO.
Gear Specialists
CLEVELAND (Sixth City)

—GEARS—

Make your motor truck as easy to handle and as economical in upkeep as a pleasure car, by installing

SIMPLE—STURDY—ACCESSIBLE

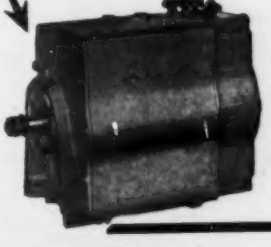
Dyneto-Entz
TRADE MARK

Electric Starter and Lighting System

Don't expect your driver to break his back cranking a big engine. He would rather let the motor run from morning till night. **You pay for gasoline — he doesn't.** When your truck stalls on the road or in traffic, think of the time it takes the driver to get under way again.

Give Your Truck Driver the Dyneto-Entz Starter

The truck manufacturer can make room on any new car for the Dyneto-Entz. On an old car a garageman or mechanic can find room for the Dyneto-Entz. One Switch does away with all other controls. A single unit motor generator not only starts the engine every time, but keeps the storage battery charged. The storage battery can not be overcharged. The wiring is simple.

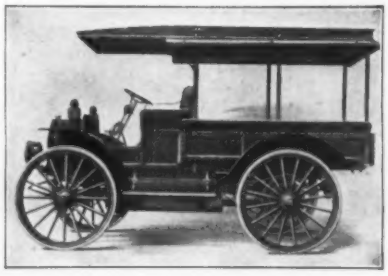


The Dyneto-Entz means that you never have a Stalled Car. Standard Equipment on Franklin, White, Tribune, Stewart, Chase and Other Cars.

Write for Full Particulars

Dyneto Electric Co.
Dept. M SYRACUSE, N. Y.
Sales Agent: T. J. WETZEL, 17 W. 42nd Street, New York City

Put a Brake On Rising Business Expenses



LAST year many of the largest businesses, in spite of an apparently satisfactory increase in volume, found an unsatisfactory profit condition existing. The reason—higher cost of doing business. The remedy—reduction of expenses without decreasing efficiency.

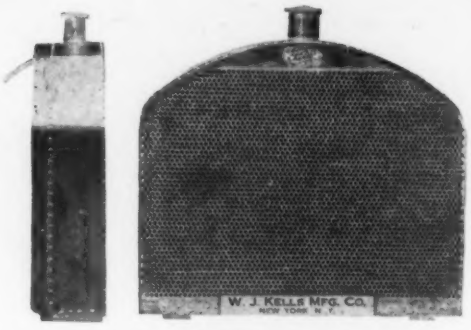
The **INTERNATIONAL MOTOR TRUCK** is built, sold and used to reduce expenses in the delivery and light hauling departments of every kind of business. The recipe is:—One truck for a small business—a fleet of them for a large business.

The **INTERNATIONAL** has a rated capacity of one-half ton. Upkeep expense for this truck is far below that of the horse equipment necessary to do the same work. It varies with conditions and localities, but nowhere is it anywhere near the cost of horse equipment.

Low first cost—low upkeep cost—simplicity and ease of management—dependability—twenty-four hour efficiency—the backing of a responsible company—all these features taken together make the **INTERNATIONAL MOTOR TRUCK** the ideal buy for the business which wants to put an effectual brake on the Rising Cost of Delivery or Service Expense. Write for catalogues and full information. A post card will do.

International Harvester Company of America
(Incorporated)
182 Harvester Building Chicago U S A

"Kells Patent" Truck Radiators



Mack 5 Ton

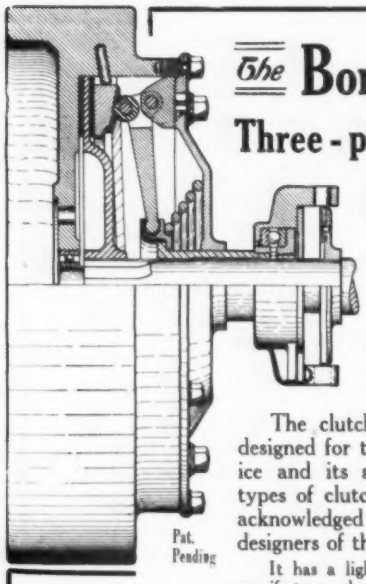
Guaranteed Absolutely Non-Leaking

Not experiments, but radiators of assured merit, built by pioneers in the Radiator field for the past twelve years. Used on Mack, Knox, Croce and many other trucks.

HOODS, TANKS, MUDGUARDS

Repairing of All Kinds on Short Notice

W. J. KELLS MFG. CO.
521-523-525 W. 45th Street, New York



The Borg & Beck Three-plate dry disc Clutch

offers a real solution of the clutch problem

Pat. Pending

The clutch has been especially designed for truck and tractor service and its superiority over other types of clutch now in use is freely acknowledged by engineers and designers of the highest standing.

It has a light friction disc that will not manifest any drag in releasing. Its engagement is gradual and positive, and it will not grab, stutter or slip. Does away with gear shifting in crowded traffic by means of friction-slippage. Can be slipped indefinitely without damage.

Truck, tractor and automobile makers are invited to write for complete description.

The Borg & Beck Co.
Moline, Ill.

Worcester Presteel

Rear Axle Housings
Ball Cups
Segments
Shims
Hub aps
Hub Flanges

Brake Drums
Brake Guides
Quadrants
Wrenches
Covers
Joint Cases

For Commercial Cars and Automobiles

We specialize in cold hollow drawing, pressing, forming, coining, punching and stamping parts for motorcycles, bicycles, cream separators, textile and electrical machinery, and for other purposes, to order.

In steel, brass, copper, aluminum, monel metal and other sheet metal alloys.

Worcester Pressed Steel Company
Main Office and Factory
Worcester : Massachusetts

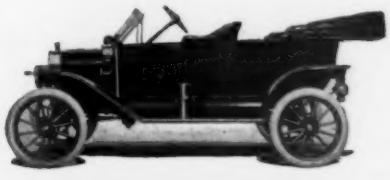
San Francisco Office, 333 Rialto Building
Portland, Oregon Office, 520 Swetland Building
Chicago Office, 1243 Peoples Gas Building
Detroit Office, 1417 Ford Building
Philadelphia Office, 418 Land Title Building
New York Office, 154 Nassau Street

Ford
THE UNIVERSAL CAR

Buy It Because
It's a Better Car

Model T Touring Car f. o. b. Detroit $550

Get particulars from Ford Motor Company, Detroit



GOODYEAR
AKRON, OHIO

Motor Truck Tires

We make, to supply an immense trade, seven types of motor truck tires—a tire for every service.

Under certain conditions you want **block** tires on rear wheels. Note in Goodyear Block Tires, **each block has its own, individual fastening.** Thus you can remove a single block without disturbing a half dozen others—or more.

We make a Solid Demountable Tire which is not only marvelously easy to **remove,** but which **can't creep.** This is accomplished by our split ring which automatically adjusts to all irregularities in tire or rims. Has hard metal sub-base, hard rubber base, soft rubber tread. All perfectly unionized. Thus we secure unusual wear at base as well as tread.

The Goodyear Side Flange Quick Detachable is a solid tire for trucks up to two tons. The ever occurring problem of preventing creeping has been completely solved by means of diagonal cross wires in the base. It is never necessary to shellac this tire to the rim.

Our seven Truck Tires are illustrated and completely described in our Motor Truck Tire Catalog.

The Goodyear Tire & Rubber Co.
AKRON, OHIO
Toronto, Canada London, England Mexico City, Mexico
Branches and Agencies in 103 Principal cities.
Write us on Anything You Want in Rubber.

AMERICAN - MADE - FOR - AMERICAN - TRADE

New Departure
GUARANTEED
Ball Bearings

To facilitate supplying demand of garages, dealers and owners for New Departure Ball Bearings, the following distribution agencies are announced, where stock of these bearings is carried:

Ahlberg Bearing Co.,	93 Massachusetts Ave.,	Boston, Mass.
Pruyn & Bilodeau,	1550 River St., Hyde Park,	Boston, Mass.
Ahlberg Bearing Co.,	1790 Broadway,	New York City
Jos. C. Gorey & Co.,	352 W. 50th St.,	New York City
The Gwilliam Co.,	Broadway & 58th St.,	New York City
Pruyn & Bilodeau,	1876 B'way, cor. W. 62d St.,	New York City
Albany Hardware & Iron Co.,		Albany, N. Y.
Syracuse Rubber Co.,	212 S. Clinton St.,	Syracuse, N. Y.
Iroquois Rubber Co.,	279-283 Washington St.,	Buffalo, N. Y.
Rochester Rubber Co.,	24 Exchange St.,	Rochester, N. Y.
The Gwilliam Co.,	1314 Arch St.,	Philadelphia, Pa.
Bumiller-Remelin Co.,	432 Main St.,	Cincinnati, Ohio
Cray Bros.,	1111 W. 11th St.,	Cleveland, Ohio
Hearsey-Willis Co.,		Indianapolis, Ind.
Machinists' Supply Co.,		Pittsburgh, Pa.
Ahlberg Bearing Co.,	2637 Michigan Ave.,	Chicago, Ill.
Chicago Pulley & Shafting Co.,	32-36 S. Clinton St.,	Chicago, Ill.
Herring Motor Supply Co.,	912-14 Locust St.,	Des Moines, Ia.
Facth Iron Co.,	1125-31 W. 8th St.,	Kansas City, Mo.
Pence Automobile Co.,	800 Hennepin Ave.,	Minneapolis, Minn.
Fred Campbell,	1109 Locust St.,	St. Louis, Mo.
Elyea-Austell Co.,		Atlanta, Ga.
The Lininger Implement Co.,	Sixth & Pacific Sts.,	Omaha, Neb.
Denver Auto Goods Co.,	1600 Broadway,	Denver, Col.
Fry & McGill,	16th & Broadway,	Denver, Col.
M. L. Foss,	1729 California St.,	Denver, Col.
Bertram Motor Supply Co.,	251 S. State St.,	Salt Lake City, Utah
J. W. Leavitt & Co.,	301 Golden Gate Ave.,	San Francisco, Cal.
Irvin Silverberg & Co.,	541 Van Ness Ave.,	San Francisco, Cal.
Kimball-Upson Co.,	609-11 K St., 608-15 Oak Ave.,	Sacramento, Cal.
Western Rubber & Supply Co.,	1011 S. Olive St.,	Los Angeles, Cal.
Western Rubber & Supply Co.,	66 S. Fairoaks Ave.,	Pasadena, Cal.
Western Rubber & Supply Co.,	1364 Fifth St.,	San Diego, Cal.
Ballou & Wright,	7th and Oak Sts.,	Portland, Ore.
Ballou & Wright,	817 E. Pike St.,	Seattle, Wash.
Child, Day & Churchill Co.,	1215 First Ave.,	Spokane, Wash.
Automobile Supply Co.,		Tacoma, Wash.

New Departure Mfg. Co., Bristol., Conn.

Splitdorf Ford Special

Waterproof, High-Tension Magneto

is enclosed gear-driven—no chains or open gears—and is a magneto of the highest grade, of attractive appearance, and easily installed upon Ford cars—commercial as well as pleasure.

A SPLITDORF Ford Special magneto increases motor efficiency, saves its cost in less gasoline consumption, assures constant electric lighting and is installed easily, quickly and inexpensively.

Write to nearest Branch House for Details

Splitdorf Electrical Co.

Atlanta—10-12 E. Harris St.	Newark—290 Halsey St.
Boston—180-182 Mass. Ave.	New York—18-20 W. 63d St.
Chicago—64-72 E. 14th St.	Philadelphia—210-12 N. 13th St.
Cincinnati—811 Race St.	San Francisco—1028 Geary St.
Dallas—402 S. Ervay St.	Seattle—1628 Broadway
Detroit—972 Woodward Ave.	Toronto—469 Yonge St.
Kansas City—1823 Grand Ave.	Dayton—Minneapolis.
Los Angeles—1226 S. Olive St.	London, Buenos Aires

When Writing, Please Say—"Saw Your Ad. in the C C J"

PLAIN COMPRESSION
(Patented)

Empress

BRASS AND STEEL

GREASE AND OIL CUPS

WE MANUFACTURE a full line of Plain, Leather Packed, Ratchet, Marine, Spring Compression, and many other styles of Grease Cups.

Our line of Oil Cups is equally satisfactory and complete.

WIRE LOCK
(Patented)

Catalogue on Application

Bowen Manufacturing Co.
AUBURN, N. Y.

Hayes Wheels

Our motor truck department is equipped with the latest improved and specially designed machinery, and with an experienced, capable organization, to turn out the best wheels ever made for motor trucks.

Hayes quality is known from ocean to ocean. **Hayes Wheels** are used, among others, by these leading automobile and truck manufacturers:

Studebaker	Standard Motor Truck
Detroit Electric	Federal
Garford	Speedwell
Imperial	Cadillac
General Motors Truck	Sandow
Brown Commercial Car	Gramm
Chalmers	Woods
Columbia	Moon
Maxwell	Regal
Rambler	Packard
Overland	Mogul
Jackson	Elkhart

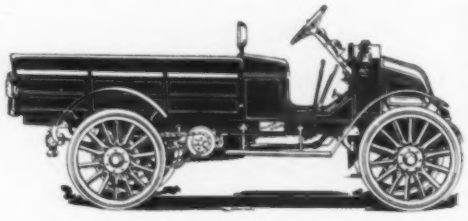
SUBMIT YOUR SPECIFICATIONS TO US FOR QUOTATIONS

HAYES WHEEL CO. :: Jackson, Mich.

PALMER MOORE TRUCKS

For Dependable Service

Air-Cooled Water-Cooled



Palmer-Moore Open Express Body
Price (Water-Cooled), $1425

Economy in motor delivery is not an experiment with **Palmer-Moore** owners—it is an assured fact—the best investment and the strongest kind of an advertisement.

The smooth-running qualities and clean-cut appearance of **Palmer-Moore** trucks give them the same position in the commercial world occupied by the finest passenger cars in the pleasure field—that of *distinction* and *merit*.

Wherever light delivery trucks are needed there is a possible sale for a Palmer-Moore.

1600 lbs. Capacity. All Styles of Bodies

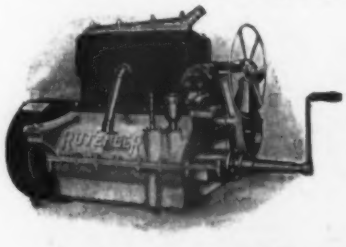
PALMER-MOORE COMPANY
SYRACUSE, N. Y.

THE RUTENBER MOTOR

Manufactured since 1901 for high-grade

Automobiles and Trucks

3¾ x 5¼ four and six cylinder
4⅛ x 5½ four cylinder
4¼ x 5¼ four cylinder
Standard or Unit
and
4 x 4, 4-cylinder Standard Type
All L-Head, 4-Cycle



Manufacturers are invited to investigate our service and our facilities. Literature on request.

The Rutenber Motor Company
MARION, INDIANA

This is the

"Jasco Tank"

¶ It is made absolutely seamless and leakless, of drawn steel, thoroughly tinned and tested. It is

THE SAFETY GASOLENE RECEPTACLE FOR THE AUTO

¶ It not only insures the safety of the car and its occupants, but stops the constant drain on pocketbooks caused by waste of gasolene. Made in all standard styles and sizes.

JANNEY, STEINMETZ & COMPANY

MAIN OFFICE: PHILADELPHIA, PA.
NEW YORK OFFICE: HUDSON TERMINAL BLDG.

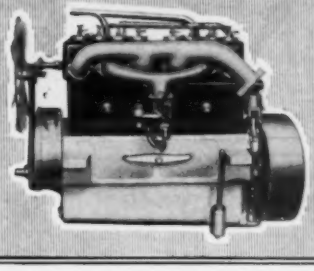
YOU wouldn't expect a race horse to do draft horse work. Then why expect satisfactory Truck service with a pleasure-car motor?

Truck work requires a motor with a capacity for 'continuous hard work. That is efficiency—and is exactly what you get in the Waukesha Long Stroke Truck Motor. It's a "make good" motor that gives the truck manufacturer full confidence that his truck will do all he claims.

Strength—long wear—economy of fuel—the ability to work under all conditions—those are what you get in every

WAUKESHA

4¼×6¾" LONG STROKE TRUCK MOTOR



Waukesha Motor. The crankshaft has a tensile strength of 70 tons. The bearings have three times the wearing quality of ordinary bearings. Let us *prove* the Waukesha Motor's supremacy. Ask us in the next outgoing mail.

WAUKESHA MOTOR CO. Dept. A. WAUKESHA, WIS.

Adams Trucks

"Deliver the Goods"

Greater Values With a Lower Price—One-Ton Chassis

$1850

That the price is lower you will see at a glance.

The increased values are just as easily recognized.

To the thoroughness of Adams' construction, and its marked simplicity of every detail affecting its control and maintenance, we have added these important features:

Continental Motors are now used exclusively on all Adams Models.

Timken Axles and Bearings are used throughout.

Bodies are built, of course, for any trade, on 1, 1½ or 2 ton chasses. Adams Trucks are standardized for more than one hundred different lines of business.

We want to hear from wide-awake dealers in unoccupied territory. Write today.

THE ADAMS BROS. COMPANY

438 West Main Cross ::: Findlay, Ohio

First American Truck Manufacturers to use the French type of hood; with radiator at rear of motor. Bodies made in all styles, to suit any industry.

ROWE MOTOR TRUCKS

are used in every line of business and in every case have proved the most economical means of hauling.

A Rowe Truck will save you money in transporting your merchandise.

The Rowe Truck is guaranteed to give

Continuous Economical Operation

Worm or chain drive. One to five ton capacity

Rowe Motor Manufacturing Co.

Downingtown, Pa.

B. A. Gramm's Motor Trucks

Newest Designs, Latest Improvements; Built in every detail to insure satisfactory and permanent results.

Write for photographs, descriptive literature and the exceptional values we offer you—far beyond all others.

The Gramm-Bernstein Co.

Exclusive Motor Truck Builders

Lima, Ohio, U. S. A.

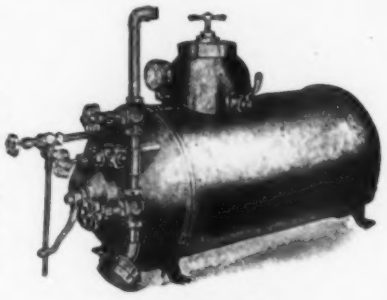
3-Gallon Approved Extinguisher

Chemical Fire Apparatus

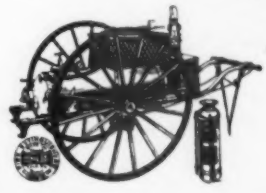
HAND EXTINGUISHERS and TANKS

of every description for department apparatus. We are equipped to make tanks of any size or type.

We also provide a complete line of Chemical Engines, mounted on wheels for service in factories, towns, villages, etc. Hose Reels, Hose Axles, Ladders, Hooks, etc.



35-Gallon Copper Tank



We can equip any chassis complete with body, chemical apparatus, etc. ***Ask us.***

O. J. CHILDS CO.

48 Liberty Street
UTICA, N. Y.

Sternberg TRUCKS

2, 2½, 3, 4, 5, 6, 7 TONS

The third most used truck in Greater New York. Only four or five trucks its equal in strong construction, low upkeep and ability. Special bodies designed.

WORM-DRIVE, 2½ TON

A new achievement in reducing unsprung weight and friction—silent—set a new low haulage cost for trucks of this capacity. **Write for special circular.**

STERNBERG MFG. CO., West Allis, Milwaukee, Wis.

ROSS STEERING and DIFFERENTIAL GEARS

are standard on good motor truck construction

WRITE FOR CATALOG

ROSS GEAR & TOOL CO.

790 Heath St. :: Lafayette, Ind.

Which Truck Is Best of the Famous Big Four?

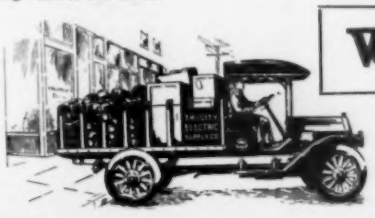
Experienced buyers of motor trucks now choose between four great makes. Each of the four is backed by millions. All are in the business to stay. Among them competition is keen. Almost daily, keenly competitive tests between these four great makes of trucks are establishing which is the best. For all are in use by the largest corporations—who use trucks by the dozen.

In pulling power the Velie Truck, the only one of the big four unadvertised until now, proves that a more powerful, slower running motor will in competitive tests out-pull and out-wear all high-speed, small-powered motors.

In three-ton trucks all four makes have 5 or 6 inch frames—channel shaped, or I-beam. But the Velie in addition to having a 6-inch I-beam frame has a 4-inch sub-frame. And in heavy hauling this extra sub-frame proves its wonderful worth.

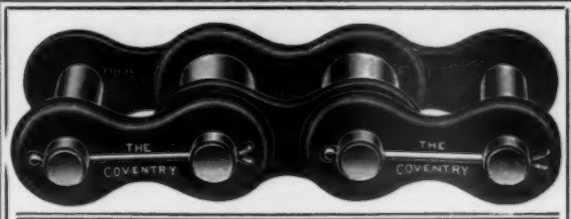
Experienced buyers can tell by comparison of specifications why it is that the Velie is winning the fiercely competitive tests between the four best makes of trucks.

Any Velie agent has these truck contest results on file—they are convincing—ask to see them.



Velie

Velie Motor Vehicle Company - Moline, Ill.



"The Coventry" Detachable Roller Chain

Note the large heavy-duty cotter-pin connecting the two rivets. The mechanical superiority of this method of coupling can easily be appreciated. Vibrations and jars cannot weaken the double-size coupling as is the case where two smaller cotter-pins, one for each rivet are employed.

Combine the established reputation of "The Coventry" Chains for precision, perfect retention of pitch and unparalleled durability with this final touch of perfection and you will understand why "The Coventry" Chains are consistently specified by those desiring the maximum of transmission efficiency.

Our catalog comprehensively covers "The Coventry" line, and will be sent immediately upon request.

Herbert F. L. Funke Co., Inc.
Dept. V 116 Broad Street New York

—ACME— Universal Joints

These are the best universal joints that a truck manufacturer could put in his product. They embody every essential feature necessary to make it the nearest perfect Universal Joint for use in trucks.

ACME JOINTS are remarkable for their simplicity and durability and are best adapted to withstand the severe wear and strain to which they are subjected in motor truck usage.

The ACME can be removed from a car without moving a unit of the power transmission. This feature alone gives it a great advantage over any other joint on the market.

They are so accurately made that they are interchangeable and necessary repairs can be made without difficulty.

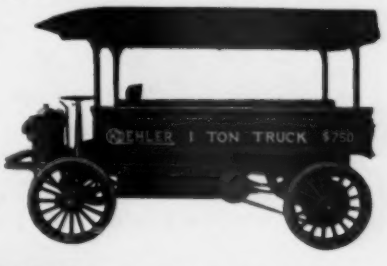
Ask us to prove that Acme Joints are better than those you are now using—we'll do it.

The Acme Universal Joint Mfg. Co.
1421 Fulford Street, Kalamazoo, Mich.

KOEHLER

ONE TON TRUCK $750.

This is a great money maker for dealers because it is the lowest priced ton truck in the market, the greatest value at any price, has the greatest adaptability to all lines of business, is simple in construction, and does its work in a highly efficient and economical manner. It *makes* money for the *dealer* because he can show any merchant that it will *save* money for him.



Here are brief specifications:

24 H. P. Motor
"L" Schebler Carburetor
Bosch Magneto
2 inch Axles
36 inch Demountable Tires
Positive Lubrication

Ten Stock Body Types

Write for full details and state territory desired

H. J. KOEHLER S. G. COMPANY
1709 BROADWAY, NEW YORK

Republic Mileage

To get mileage you must have quality tires and that is the only kind we make. Of course they cost a little more. That is because they contain the best materials and are the product of the highest skilled workmanship.

One Republic Tire Sells Another

and the man who uses Republics will take pleasure in telling you why. The Republic Staggard Tread is the original non-skid tire just as it is the most effective. Look at the Staggard's patent dates—Sept. 15-22, 1908.

The Republic Rubber Company

YOUNGSTOWN *Branches and agencies in all the principal cities.* OHIO

BUCKEYE Motor Truck Jacks

Buckeye Motor Truck Jacks are safe, reliable and made to stand the wear and tear for which they are intended. They are fully guaranteed, and cannot possibly drop with a load. They are made from Steel Drop Forgings, best finish and workmanship throughout.

Get our prices before you place your orders for jacks, we can save you money.

No.	Height Bar Down	Raise of Bar	Height Bar Up	Weight	Capacity		List Price
7	11¼"	6½"	18"	16 lbs.	2½ tons	with formed handle	$10.00
13	14¾"	7½"	20½"	26½ "	3 "		15.00
14	14¾"	7½"	20½"	33 "	5 "		16.00
9	11½"	6"	17½"	10 "	1½ "		6.00

Write today for descriptive catalog. Made only by

THE BUCKEYE JACK MFG. CO., Alliance, Ohio

FRAMES

THE PARISH & BINGHAM CO.
CLEVELAND, OHIO

WE HAVE MADE DURING JULY, 1912 TO JULY, 1913 **340,890 FRAMES** OF ALL SIZES FOR 105 CUSTOMERS

Chilton Advertising Post Cards

in colors should be included in every advertising campaign

Your prospective customer *may* see your catalog or magazine advertisement, but he is sure to read your CHILTON POST CARD.

The use of the post card in colors is the modern way to advertise and economize. It is a *personal-appeal* form of publicity which invariably attracts attention, and is sure to land orders.

Forward us your printed matter, state what you want to advertise and how many cards you can use, and we will do the rest.

CHILTON COMPANY, Market and 49th Streets, Philadelphia, Pa.

SCHWARZ WHEELS

These are the wheels to put on your truck, because time, tests, service and experience have each proved the superiority of their construction over all other types for use on commercial vehicles.

With trucks, heavy in themselves and designed to carry still heavier loads, the factor of safety looms up big in the mind of the careful builder. The wheels must be able to stand the strain or the reputation of the truck suffers.

Then it is that he seeks Schwarz Wheels, for he knows that their construction enables them to bear the burden as no others can do. He buys them, not because they are different or for the name, but for the strength, safety, economy and dependability that the name stands for.

Schwarz construction is different from all others. The ends of the spokes are grooved and mortised and dovetail or interlock, forming a rigid immovable center assembly which cannot work apart, get out of true or loosen under the most severe strain.

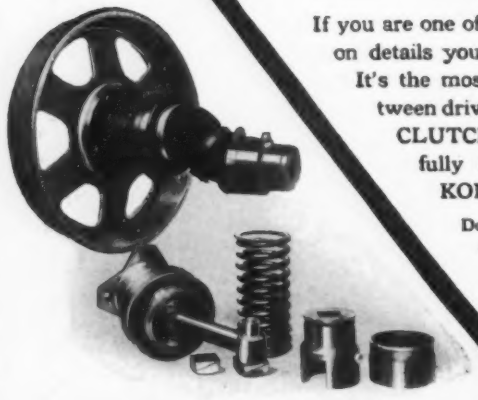
It is this which makes nearly all builders of quality automobiles and commercial vehicles choose Schwarz Wheels for their product. For a detailed explanation of this construction and its advantages send for "Bear the Burden"—it's interesting and free.

The Schwarz Wheel Company

Frankford, Philadelphia, Pa.

KONIGSLOW CLEVELAND

can solve your clutch problem



If you are one of those concerns who are rather keen on details you know that the CLUTCH talks. It's the most frequent point of contact between driver and car. KONIGSLOW'S CLUTCHES will speak as forcefully for you as they do for KONIGSLOW

Don't wait till you are ready to place orders---write today to

KONIGSLOW
CLEVELAND

For
Clutches
Clutch Rocker Shafts
Control Levers
Universal Joints

The Otto Konigslow Mfg. Co.,
Cleveland

Detroit Office
J. H. GOULD
1202 Majestic Bldg.

Michigan Steel Casting Co.

FOR CASTINGS OF GREATEST STRENGTH
AND SMOOTHEST FINISH

Detroit, Michigan

The Wonderful Records Made by BESSEMER TRUCKS

throughout the country, during the recent blizzards, resulted in

Numerous Re-Orders

Strenuous service has no terrors for the Bessemer Truck. Each truck, before leaving the factory, must go through a test that is 100% more severe than it will ever receive in service. Sturdiness is built into every Bessemer, from radiator to tail gate.

DEALERS: Write us about a special proposition we have to offer you. The truck that brings re-orders from the largest representative concerns throughout the country, is the truck for you to handle.

THREE MODELS:

MODEL C, 25 H. P., $1250
1 Ton Capacity—Chain Drive

MODEL A, 30 H. P., $1800
1½ to 2 Ton Capacity—Chain Drive

MODEL D, 30 H. P., $2300
1½ to 2 Ton Capacity—Worm Drive

Bessemer Motor Truck Co.
GROVE CITY, PA.

Boston — Branches — Pittsburgh
A. C. Vanderpoel, 18 Broadway, New York City, Export Rep.

CULLMAN SPROCKETS and Differentials

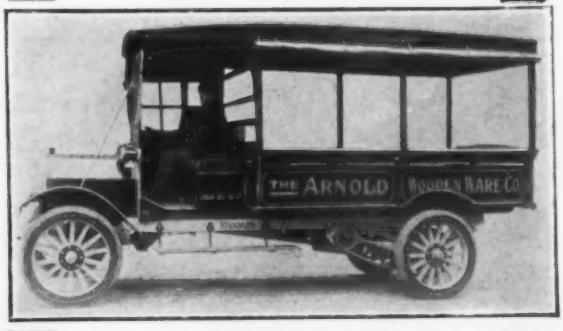
in stock and to order.

Send for catalog and let us quote you on your requirements.

CULLMAN WHEEL COMPANY, CHICAGO
1351 GREENWOOD TERRACE

Standard of Ohio

1 TON $1600



1½ TON $1800

2 TON $2000

Chain Drive

Our three models of chain drive trucks shown herewith are of the capacities which are desired by 70% or more of motor truck buyers and have been designed especially to give service of the highest character at the minimum cost of operation and maintenance for trucks of their class.

They are built to meet varying conditions—different lengths of wheelbase depending upon the kind of bodies required and different gear ratios depending upon road conditions.

They have proven their worth and economy in nearly every prominent line of business and their exceptional efficiency is attested by the many repeat orders received.

EVERY UNIT MADE BY A SPECIALIST

Every part of each of our models is the product of a specialist who has attained pre-eminence in the making of that particular part.

Nothing could be more eloquent of the quality of the Standard of Ohio than a mere recital of the famous specialists whose products are included in our various models, as follows:

Ergon (Hazard) Motors
Bosch Magnetos
Dayton Air-Friction Carburetors
Kurtzner Radiators
Hydraulic Pressed Steel Frames
Perfection Springs
Timken Front Axles
Liggett Axle Beams
Chautauqua Worm Drive Axles
Cleveland Worms and Gears
Covert Transmissions
Brown-Lipe Transmissions
Brown-Lipe Clutches
Lavigne Steering Gears
K. B. Universal Joints
Russell Jackshafts
Baldwin Chains
Bimel Wheels
Any Standard Make of Tires
F. & S. Bearings
Timken Roller Bearings
Bower Roller Bearings
Hyatt Roller Bearings
Packard Cable
Standard Steel Castings

This standardization of parts assures lower price, better service, less cost for repair parts, and a reinforcement of our guarantee by that of the parts maker.

The Standard of Ohio

Sales Office: 1820 Euclid Ave, Cleveland, Ohio.

Motor Trucks

Worm Drive

Our three worm drive models are the best exponents, in their class, of the extreme silence, efficiency, durability and simplicity of this increasingly popular type of construction.

They have the worm and gear principle carried out to absolute perfection and embody the products of The Cleveland Worm & Gear Co.'s Worms and Gears and The Chautauqua Motor Co.'s Worm Drive Axles, both of which concerns have achieved the greatest success in perfecting this form of drive and its installed application.

The addition of worm drive models to a dealer's line is becoming a positive necessity in order to cope with competition. The dealer handling the Standard of Ohio has a complete line of both chain and worm drive models enabling him to meet every requirement.

SOME GOOD TERRITORY OPEN FOR ESTABLISHED DEALERS

We are looking for good dealers who are far sighted enough to realize that there is a real opportunity for profit in representing the Standard of Ohio.

Such dealers will have a representative line, broad and comprehensive in scope, and covering the needs of virtually every prospect for a motor truck.

They will have the satisfaction of selling trucks which bear in every part incontrovertible evidence of quality and whose price is so reasonable, quality considered, that it makes sales easy.

The company is well established, of good reputation, and financially able to take care of every obligation that might arise. We are in business to stay and our busy plant at Warren, Ohio, is the best evidence of our success.

We know how to help you make sales and it is our policy to do so and to assist you in making your customers satisfied.

Our line offers you the means of building up a successful business. Write us for detailed specifications and our selling plan.

District Manager N. Y. State:
W. T. BUTLER, 348 Baynes St., Buffalo, N. Y.

Motor Truck Co.

Factory and Main Office: Warren, Ohio.

1 TON $1900

1½ TON $2100

3 TON $3000

"We have nothing but the highest words of praise for your product and have not failed at every opportunity to advertise that we are installing the Buda Motor in our machines."

BUDA MOTOR

"The Part that Sells the Truck"

likes to receive, and does receive many letters like the one from which this is an extract. The letter was from the manufacturer of a very remarkable machine. We will give you the name if you ask it.

THE BUDA COMPANY

FACTORY, HARVEY, ILL., (Chicago Suburb)

Address all correspondence to our **FACTORY REPRESENTATIVES**

BRANDENBURG & COMPANY

1108 S. MICHIGAN AVE. CHICAGO — 57TH & BROADWAY NEW YORK — FORD BUILDING DETROIT

This Shows the Construction of

BRO-GOR

Truck Chains

This shows a complete unit consisting of a chain, the flat side of whose links are always to the tire; a clamp to be fastened around the spoke, which can be left there indefinitely, and a repair link open at both ends which joins the chain and the clamp.

Six or seven of these units, placed on *alternate* spokes constitute an equipment for a wheel which protects against skidding and accidents resulting therefrom. It gives a sure and certain grip which gives traction under the most disadvantageous circumstances.

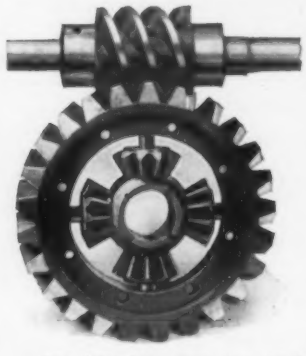
These chains are adaptable to every truck built, there being 12 different patterns of clamps and 3 different weights of chains. They are very strong and durable throughout. Easy to attach and in case of accident new chains can quicky be substituted. Very efficient, economical and easy on tires. Fully guaranteed. Write us about them for your trucks, giving full data.

The Brocket-Gorham Co.

Marion, Ohio

HINDLEY

WORM GEAR AXLE



Experience has proved that the **Hindley Worm Gear Axle** is the ideal drive for heavy duty trucks. Running in oil, it is noiseless and is so built as to be proof against dust and trouble.

Trucks having this drive have given much longer service, been free from the expense and annoyance attending chain drives and operated at less cost.

The incorporating of the **Hindley Worm Gear Axle** in your trucks will not only make them better trucks from the standpoint of service, but more saleable ones as well.

We place the services of our engineering department at your command if you are interested in adopting this drive.

It is worth while writing us for further information.

The Hindley Gear Company

1105 Frankford Ave., Philadelphia, Pa,

A Popular Size—A Popular Price—And A Krebs

MODEL E—HALF-TON—
KREBS, $1,100

Krebs quality, reliability and low maintenance costs are features with which every prospective purchaser of a motor truck should be familiar. Write us today for full information about this popular model.

Model E, ½ Ton Krebs

Loading Platform 44 in. x 68 in. back of seat.

Price of chassis, $1,000.

Price with body shown, $1,100.
Same body including screens, $1,150.
Without top, $1,050.
With closed panel body, $1,200.

We can place a few more dealers in good territory.

THE KREBS COMMERCIAL CAR CO., CLYDE, OHIO

Crown Worm-Drive Motor Trucks

1 Ton—1½ Ton—2½ Ton

A COMPLETE SELLING LINE OF DEPENDABLE TRUCKS

Responsible, energetic dealers are invited to correspond with us at once. We seek a few more selling representatives—live ones—those who recognize merit and desire to connect with a dependable, lasting and efficient selling proposition.

Crown Worm-Driven Trucks Stand Supreme

Send for complete catalog, terms and detailed information. Write today.

CROWN COMMERCIAL CAR CO.

Milwaukee, Wis., U. S. A.

Factories: North Milwaukee, Wis.

Pierce-Arrow

5-Ton and 2-Ton Trucks

Every workman connected with the Pierce-Arrow organization is one of its salesmen. Every service station is as much a part of our sales force as the man who actually places an order. The purchase of one of our trucks is merely the beginning of a long and mutually profitable relationship between the owner and our organization.

The Pierce-Arrow Motor Car Co., Buffalo, N. Y.

When Writing, Please Say—"Saw Your Ad. in the C C J"

Motor Truck Bands

MADE WITHIN THE FOLLOWING

Dimensional Tolerances

(ADOPTED BY THE SOCIETY OF AUTOMOBILE ENG.)

1.—Tolerance in circumference of felloe band:

	Plus	Minus
Before application to wheel - -	1-32"	1-32"
After " " " - -	1-16"	1-32"

Variation from precise measurement shall be uniform over entire width of band.

2.—Tolerance in width of felloe band:

	Plus	Minus
Up to and including 4" - - -	1-32"	1-32"
4—1-16" to 6" - - - - - -	3-64"	3-64"
6—1-16" to 12" - - - - - -	1-16"	1-16"

3.—Variation in trueness of band when placed on surface plate: Band shall touch at all points within 1-32" up to and including 6" width. Over 6" width within 1-16".

4.—Variation in thickness of band: .006" plus or minus.

5.—Trueness to round. The radial tolerance on the wheel when felloe band is applied shall be 1-16" plus or minus. This plus or minus tolerance must not occur at diametrically opposite points. There shall be no flat spots or kinks in felloe band on the finished wheel.

The Standard Welding Company
CLEVELAND
NEW YORK CHICAGO DETROIT

Spicer Universal Joints

Universally Accepted as the Most Dependable Flexible Connection Known to Motor Car Practice

Oil-Tight Dust-Proof

PARTS INTERCHANGEABLE

Spicer Manufacturing Company
Plainfield, N. J.

Sales Representatives:
K. Franklin Peterson, 122 S. Michigan Blvd., Chicago
L. D. Bolton, 2215 Dime Savings Bank Bldg., Detroit
Thomas J. Wetzel, 17 W. 42d St., New York
Foreign: Benjamin Whittaker, 21 State Street, New York

Chilton Advertising Post Cards

in colors should be included in every advertising campaign

Your prospective customer *may* see your catalog or magazine advertisement, but he is sure to read your CHILTON POST CARD.

The use of the post card in colors is the modern way to advertise and economize. It is a *personal-appeal* form of publicity which invariably attracts attention, and is sure to land orders.

Forward us your printed matter, state what you want to advertise and how many cards you can use, and we will do the rest.

CHILTON COMPANY, Market and 49th Sts., Philadelphia, Pa.

DON'T EQUIP YOUR TRUCK
with a
Littleford All-Steel Dump Body

merely because it is the most attractive. Do so because it is the body that a well-designed truck demands and the body that the purchaser insists upon having.

We Can Manufacture Bodies to Suit Your Requirements

SEND US YOUR SIZES AND SPECIFICATIONS, WE WILL MAKE DRAWINGS AND QUOTE YOU PRICES

LITTLEFORD BROS.
CINCINNATI, OHIO

PIERCE

Speed Controllers

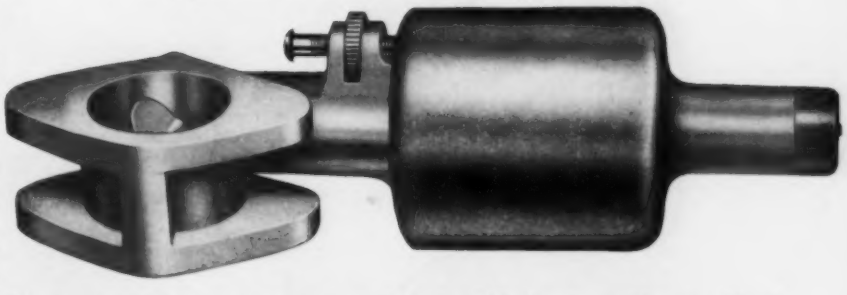
May be Installed on YOUR Car by ANYONE

Operated From Front Wheel

Assures increased efficiency and durability for every part, economy of operation, freedom from abuse; removes temptation to overspeed and liabilities of accidents. Used by leading truck and car makers and many prominent concerns. Absolute protection for your car. Send for prices, blue prints, etc.

Pierce Motor Governor

Operated From the Engine Direct



Attached to any exposed rotating part of any motor and adjustable to any desired number of revolutions per minute. Suitable for trucks, automobiles, tractors, stationary motors and various kinds of machinery. Used by Continental, Velie, Davis, Indiana, Lambert, Wisconsin, Rutenber, and others. Insist on having this governor on your motor.

The Pierce Speed Controller Company

Anderson, Indiana, U. S. A.

Originators of Speed-Controlling Devices for Gasoline-Driven Cars

A Continuous Procession
of Trucks Equipped with

Phineas Jones & Co. Wheels

can be seen in almost
any large city, any time

The knowledge, experience and ability that comes from 58 continuous years of successful wheel making are concentrated in our product. Because of their past records, their present performances, and their unexcelled quality, truck makers and owners put them on their cars with a feeling of absolute confidence.

PHINEAS JONES & COMPANY
Established 1855

305 Market St., Newark, N. J.
12th Ave. & 55th St., New York, N. Y.
1625 South Los Angeles St., Los Angeles, Cal.

FEDERAL

Why the Federal in Your Line?

The proven adaptability and efficiency of the Federal in more than 120 different lines, and for more than three years, are, in themselves, sufficient reasons.

The wide distribution of the Federal, from coast to coast, in Alaska, Cuba, Porto Rico, the Philippines, the South American Republics, Australia, Portugal and India, confirms the correctness and soundness of Federal design and construction.

The fact that the largest users of motor trucks in the world operate fleets of Federals.

The fact that when another year rolls 'round, the owner of a Federal will have a truck that will still be backed by one of the most responsible organizations in the industry—a truck that will not have deteriorated in value or desirability, either because the maker has gone to the industrial graveyard, or because the truck itself has been forced to the bargain counter.

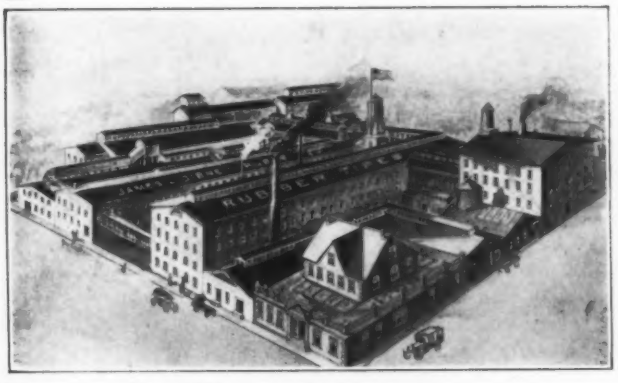
Consider these facts carefully, for the *right* motor truck will be of wonderful help in your business; but be sure it is the right truck.

Illustrated literature will be sent upon request.

PRICE Includes Seat, Lamps, Tools, etc.	$1800 F.O.B. DETROIT	Body Extra Built to meet individual requirements

Federal Motor Truck Company
Detroit. Michigan.

GIBNEY WIRELESS TIRES



FACTORY: CONSHOHOCKEN, PA.

These are the original wireless tires—the ones whose phenomenal success has caused a host of imitators to spring up. They are the tires that proved the wireless principle was the right one for commercial vehicle use; the tires whose supremacy has been proved in the severe tests of actual service; the tires which have established records that others have been unable to equal. They are the tires which discriminating buyers insist upon having, for they are

THREE YEARS AHEAD

The first to be conceived, worked out and put in use, they had a three years' leadership over all other makes, which they have ever continued to maintain.

There is good money in an exclusive agency for GIBNEY WIRELESS TIRES. If you are a live, energetic dealer wishing to make money with a high-class, dependable tire of proved merit, it will pay you to write for our exclusive agency proposition.

GIBNEY
Tire & Rubber Co.

Philadelphia Baltimore
New York Boston
Washington Minneapolis
St. Louis Detroit

When Writing, Please Say—"Saw Your Ad. in the C C J"

The Stewart Hub Odometer

Proves the Worth of Your Truck Drivers

THERE is only one set of workmen connected with your business whose work you do not keep tab on. These are the men who drive your motor trucks. There is only one way to know just how much they are worth to you—in miles. Only one positive, unfailing way to do this and that is with the Stewart Hub Odometer.

Every bit of work done by every other man in and about your factory shows on the time slips. Hour by hour you know what each man is doing and what he is worth. And because his labor is measured in units of work—finished—per—day, you gauge his worth that way.

The worth of the truck driver should also be measured in units—but in his case the units consist of **miles traveled.** How do you know the comparative value of your drivers? How can you judge them and pay them justly? How can you produce concrete evidence that one driver is worth more or less than another? You cannot know, you cannot judge, without the Stewart Hub Odometer to give you the exact facts.

The Stewart Hub Odometer is the only instrument that will unfailingly and correctly tell you just what each truck does each day. The check on each day's work of each of your drivers is but one of the valuable things it does. It furnishes the only reliable basis on which your whole motor delivery service can be built up in order to be profitable and efficient. Perhaps your motor delivery costs you too much. With a Stewart Hub Odometer you can check all your costs against all your deliveries, and **know** the exact per mile cost of your delivery system.

No like instrument ever offered before has ever been as absolutely reliable as the Stewart Hub Odometer. No other has ever been built that like the Stewart Hub Odometer is proof against mud, oil and water.

The Stewart Hub Odometer has no uncertain springs, pawls and ratchets. Its dials are positively controlled by our Geneva stop mechanism, which permits only the right dial to turn at the right time. It registers up to 100,000 miles, and tenths of a mile, and repeats.

The Stewart Hub Odometer is an absolutely essential part of profitable motor trucking. No amount of guessing and no other instrument can take its place. Attach a Stewart to the hub of each of the trucks you now operate. And be sure that the new trucks you buy all come equipped with the Stewart Hub Odometer.

$15

Complete

With Hub Cap

A sturdy, sightly instrument that can be fitted to the hub of any truck or electric pleasure car. It registers to 100,000 miles in tenths, and repeats. The numerals are large, clear and easy to read. The answer is always there at a glance. The mechanism is fully protected from mud, oil, water and other injury.

At the right is an interior view of the Stewart Hub Odometer. Note its simplicity, positive drive and Geneva Stop mechanism which moves and locks the dials with never-failing precision. There can be no error.

Stewart-Warner Speedometer Corporation

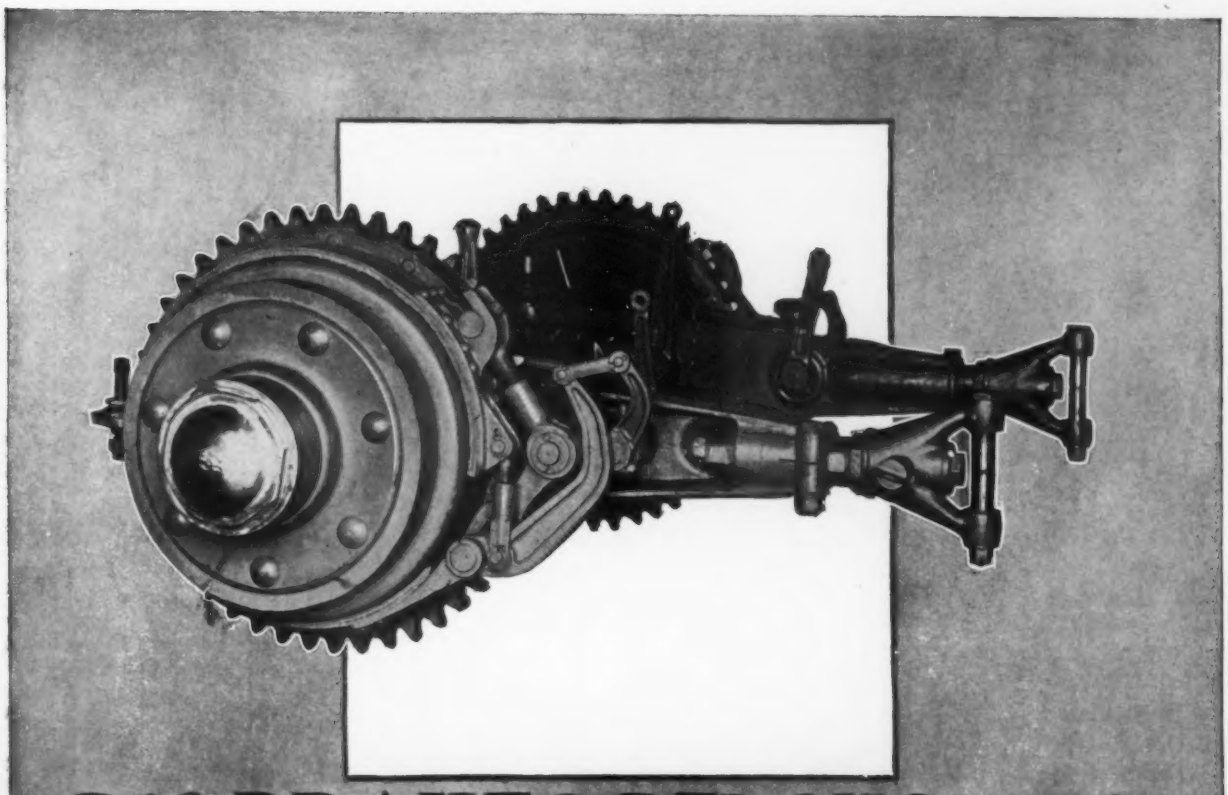
Factories: Chicago, Ill. and Beloit, Wis.

Direct Factory Branches

Atlanta, Ga. *Chicago, Ill.* *Indianapolis, Ind.* *Minneapolis, Minn.* *Pittsburgh, Pa.*
Boston, Mass. *Cleveland, Ohio* *Kansas City, Mo.* *New York, N. Y.* *San Francisco, Cal.*
Buffalo, N. Y. *Detroit, Mich.* *Los Angeles, Cal.* *Philadelphia, Pa.* *St. Louis, Mo.*
London *Paris*

And Service Stations in all cities and large towns

When Writing, Please Say—"Saw Your Ad. in the C C J"



The BRAKES BELONG on the WHEELS-NOT on the JACK-SHAFT

Sheldon Double-Brakes-On-The-Rear-Wheels

Has sounded the death-knell of the jackshaft method of braking. It spells finality as to the location of the brakes because it puts them in the only logically correct position—ON THE WHEELS.

SHELDON EQUIPMENT gives you two sets of brakes on the rear wheels. There is always certainty as to the braking efficiency—which is not true of jackshaft brakes. Suppose with your present method, the chains should "jump off" at the critical moment? Could you depend on your single set of rear wheel brakes skidding the wheels?

Take our 3-ton equipment as an efficient example. The outside brake is of the wrap-up type acting on the 18-in. by 3-in. pressed steel drum. The inside brake is of the self-intensifying type. Either brake will skid the wheels. You can take your choice of foot or hand brake. There is a braking surface of 500 square inches. To stop a 3-ton truck with 50 per cent overload means applying only 200 pounds pressure per square inch to the braking surfaces. On many trucks the pressure runs as high as 700 pounds per square inch. The self-intensifying feature of Sheldon Brakes gives a uniform pressure on the whole surface of the drum. This is not the case with any other type of brake.

Can you wonder that ordinary brakes fail to hold at the critical moment?

IN A YEAR OR TWO EVERY HIGH-GRADE TRUCK WILL BE EQUIPPED WITH BRAKES ON THE REAR WHEELS. JACKSHAFT BRAKES ARE ALREADY DOOMED! THE LEADING TRUCKS ARE COMING TO DOUBLE-BRAKE REAR WHEEL EQUIPMENT.

Why not make your truck one of the leaders? It'll be a selling point in your favor.

Write us for information on this subject—today.

SHELDON AXLE COMPANY, Wilkes-Barre, Pa.

Chicago Office: 68 E. 12th St.

San Francisco Office: 444 Market Street

Detroit Office: 1215 Woodward Avenue

Advertisers' Index

Veeder HUB ODOMETER

This is a compact, rugged, durable instrument, easily attached, which gives an absolutely accurate record of the truck's mileage. It registers forward whether the car is running forward or backward, it can't be disconnected or put out of service or made to falsify records in any way.

This new model is designed to withstand vibration and it faithfully performs its duties under the discouraging conditions. No springs, little friction, wearing parts of hardened steel, dials and gears of brass or bronze, brass casing, etc. Send for literature.

At your dealer's, direct from factory or at the following agencies:

T. H. CRANSTON & CO.
56 E. Randolph Street
Chicago

BERNARD I. BILL
543 Golden Gate Avenue
San Francisco, Cal.

FORM K
$20

THE VEEDER MANUFACTURING COMPANY
10 Sargeant St., Hartford, Conn.
Makers of Cyclometers, Odometers, Tachometers, Tachodometers, Counters and Small Die Castings

Packard

SERVICE KEEPS YOUR TRUCKS ON THE JOB

Packard service is based on our knowledge that mechanical delay means unnecessary expense to the truck owner.

The cost of a part may be insignificant, but the cost of an interrupted business schedule is often prohibitive. When a truck is laid up waiting for repair parts, your interest on investment, insurance, driver's wages and garage rent are going on at the same rate, while you pay an excessive charge for emergency hauling.

Delays mean excessive cost that must be added to the first cost of the truck. That is why a truck without service is expensive at any price as compared with a Packard.

Repair parts for Packard vehicles, carried by the Packard factory and Packard dealers, represent an investment of one million, two hundred and fifty thousand dollars.

Packard service means more than keeping repair parts in stock. Every Packard part is ready for quick installation. It is standardized: no filing, no machining, no tinkering. Where a fleet of Packards is in service, the parts are interchangeable in case of need.

The Packard dealer's thorough inspection and written reports insure continuous operation at minimum cost. Our technical men are always ready to give your driver expert assistance.

In short, Packard service makes your transportation schedule a known quantity.

Every time you see a Packard truck, remember Packard service stands ready to keep that truck operating every minute of every working day. Packard service is a part of the truck, a part of your original investment. That is one reason why Packard trucks are predominant in 185 lines of trade.

The Loose-Wiles Biscuit Company after using Packard trucks for three years, have just placed their tenth repeat order which calls for 24 two-ton and three-ton units.

ASK THE MAN WHO OWNS ONE

PACKARD MOTOR CAR CO., DETROIT

LINCOLN HIGHWAY CONTRIBUTOR

Selling Fleets of Commerce Cars

BIG merchants who began with two and three Commerce Cars are now installing fleets of Commerce Cars as the solution of their delivery problems.

They have tested the Commerce Car as they once tested adding machines and cash registers, and found it to be an actual business economy and, consequently, a sound business investment.

Every Commerce Car in operation today is selling Commerce Cars. Its actual performance is its best selling point. Merchants are buying Commerce Cars today on the records of the Commerce Cars operated by their competitors.

This is the fourth year of the Commerce Car. And the enormous demand for the Commerce this year is due, we believe, to our two years of experimenting and testing under the severest possible conditions before we offered the Commerce Car for sale.

Today we know we have the simplest, most dependable, most efficient and most economical delivery car on the market.

And the sale of the Commerce confirms that judgment.

Commerce Car dealers deserve a large share of the credit of Commerce success.

We have selected them very slowly and carefully. They are business men—in the automobile business for consistent growth and permanent, legitimate profits. They have the spirit of the Commerce Motor Car Company. Many of them are pleasure car dealers who have been progressive enough to install a Delivery Car Department and thereby establish a steady twelve-month-a-year business.

They have found the Commerce Car to be precisely all we claimed for it—a single chassis, a single model (that's all we make) "fool-proof" delivery car for which the merchant of the big city and the merchant of the small town have been waiting for ten years.

If you are that kind of a dealer, we want you. Write or wire for details. Better yet, come to Detroit, see the Commerce Car and the Commerce factory, and sense the spirit of our whole organization.

THE COMMERCE MOTOR CAR COMPANY

Administration Department, 625-630 Penobscot Bldg. **DETROIT, MICHIGAN**

SPECIFICATIONS

1000-pound capacity, 25 per cent overload, guaranteed.

Equipment, including electric horn, complete.

32 x 3½ Goodyear pneumatic tire, or 34 x 2½ Goodyear-Motz truck tire.

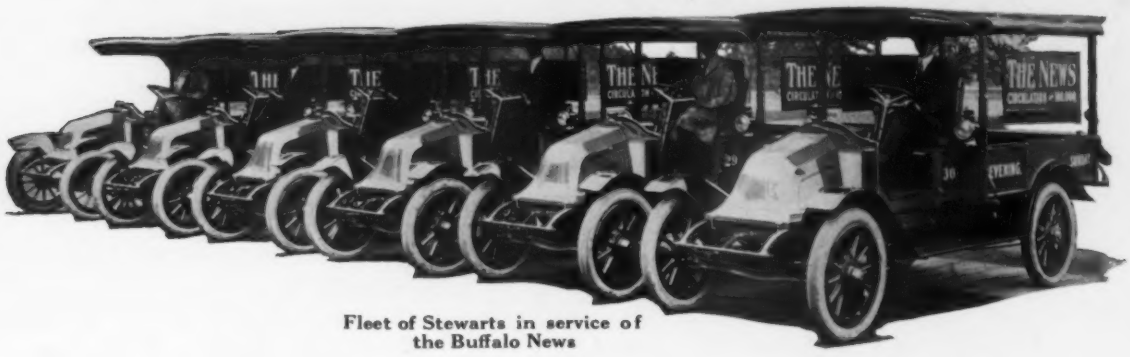
Express, full panel, or canopy top.

Clear floor space:
64 inches long;
42 inches wide;
52½ inches high.

Gear ratio:
6 to 1 on high.
20 to 1 on low.

Friction Drive.

Wheelbase, 102 inches.



Fleet of Stewarts in service of the Buffalo News

Why We Concentrate on One Model —A 1500-Pound Truck

Exclusively as a 1500-pound delivery truck, the Stewart is built. We build it in this carrying capacity for these essential reasons:

In the first place, a 1500-pound delivery truck has the widest possible range of usefulness and serves an almost unlimited field. The field for a heavier truck than 1500 pounds narrows down. For instance, a five-ton truck has less than one-fifth the selling possibilities of the Stewart. And with a lighter truck than the Stewart the tendency of drivers is to overload and to wear out the vehicle quickly.

Thus the Stewart is the ideal type of delivery truck for delivery purposes. It covers the ground quickly, dependably, economically. It can replace two horses at a lower hauling cost. It can do the work of four horses at less than one-half the cost. Some Stewarts are supplanting as many as six horses.

Furthermore, we build the Stewart in 1500-pound capacity because we believe in concentration. The most successful concern in the pleasure car business today concentrates on one model, just as the builders of the Stewart do—on a type that reaches the widest possible field at the lowest possible cost.

This policy of concentration has been proven right by the test of experience. It pays the manufacturer; it pays the dealer; it pays the customer.

The Stewart sells for **$1500.** It is the truck that reaches the unlimited market. It is properly designed and well built by the largest exclusive manufacturers of 1500-pound trucks.

Stewart
Delivery Trucks

Consider This Remarkable Record

1. We sell more Stewart trucks today than any other exclusive builder of 1500-pound delivery trucks.
2. A big percentage of our business consists of repeat orders.
3. No purchaser of a Stewart truck has ever subsequently bought any other 1500-pound truck but the Stewart.
4. We haven't a single dissatisfied owner.

Write us for further information about the Stewart opportunity to dealers.

Stewart Motor Corporation, Buffalo, N.Y.

T. R. Lippard, Pres. and Gen'l Mgr. R. G. Stewart, Vice-Pres. and Chf. Eng.
R. P. Lentz, Sec. and Treas.

See the Stewart at the Boston Motor Truck Show

When Writing, Please Say—"Saw Your Ad. in the C C J"